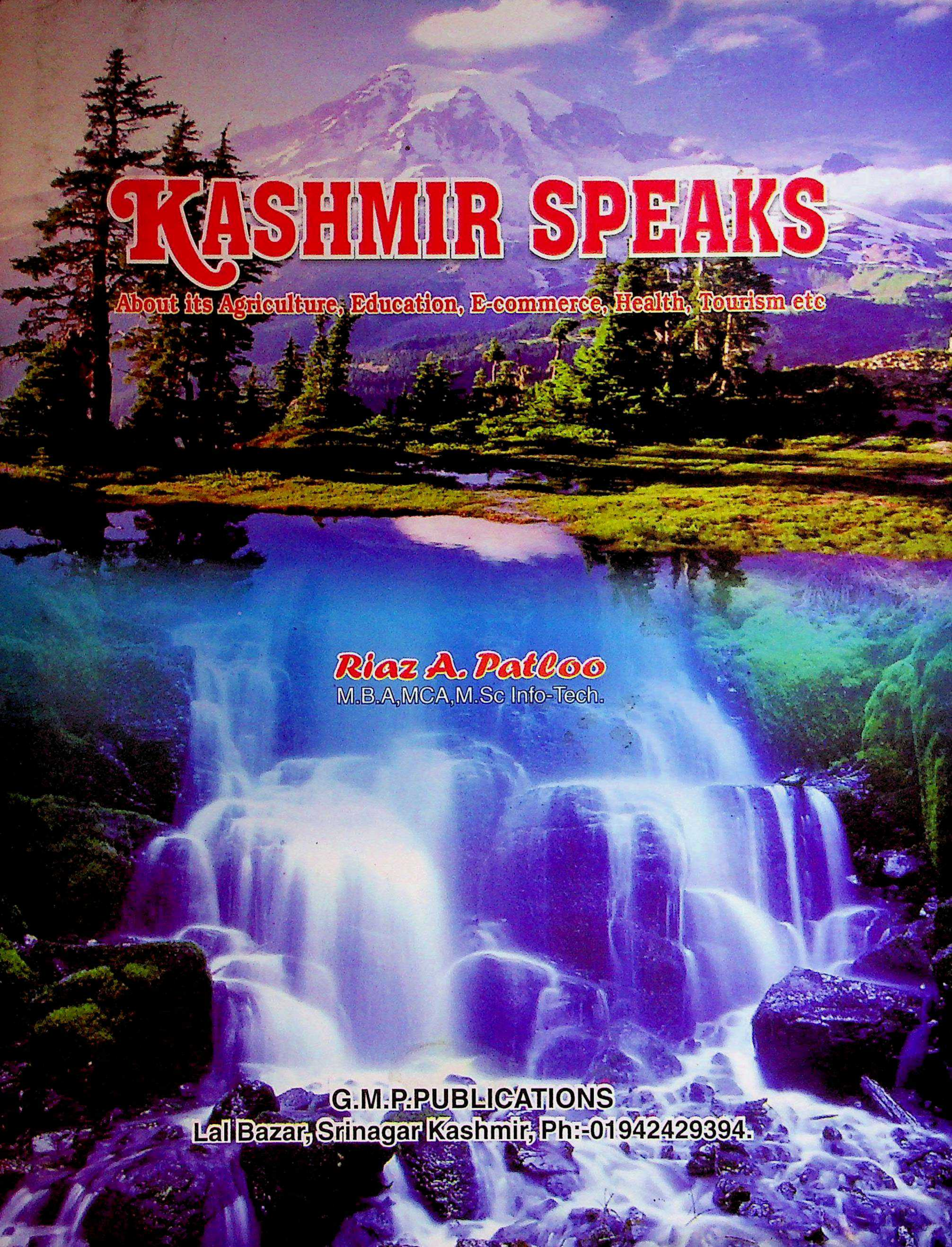

KASHMIR SPEAKS

About its Agriculture, Education, E-commerce, Health, Tourism etc

Riaz A. Patloo
M.B.A,MCA,M.Sc Info-Tech.

G.M.P.PUBLICATIONS
Lal Bazar, Srinagar Kashmir, Ph:-01942429394.

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The views expressed in the articles are
the personal views of the writers

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Ph:-01942429394., PIN- 190011

Dedicated to my
Parents and Wife

Foreword

Kashmir has rich heritage and tradition of learning and innovation. Kashmir people have displayed their dynamism in adopting new innovative thoughts and practices enriching spiritual and material culture of the people. Mother nature has endowed the region so well that many call it paradise on earth. Agriculturally and in craftsmanship also people of Kashmir have done well. Produce and products of Kashmir are valued in the country. More than 75% of the people draw sustenance from agriculture and allied activities. Productivity of rice inspite of cold climate is higher than national average, so is the case in milk, temperate fruits, vegetables. Kashmir is known for its high quality saffron. Its meadows and pastureland sustain pastoral livestock husbandry. However, it has yet challenges to meet especially in achieving reasonable self sufficiency in meat, livestock feed and vegetable in winter months.

Mr. Riyaz Ahmad PatIoo has spent many years of his useful life in association with print and electronic media. He is highly qualified person having vast knowledge about I.T and has carved out a place in journalistic and IT circles.

It gives me immense pleasure to note that the book "KASHMIR SPEAKS" covers a wide range of topics including Agriculture, Tourism, Media, Information Technology, Health, and Unemployment Problem etc. I hope the book shall serve as useful resource material for the students in particular and people in general. I congratulate Mr. PatIoo for putting these papers together and bringing them out in the book form as a journalist. I hope readers would find this publication very interesting and useful. The book shall definitely help people and making them aware about surroundings, places, people and their activities.

I compliment Mr. PatIoo for this contribution and hope he will continue, his good work with the same dedication and zeal.

Prof. Anwar Alam
Vice Chancellor
SKAUST (K)

January 2007

PREFACE

"Sensitive man lives a miserable life" and the person who feels cannot fail to notice the massive problems which we as the society are facing. The grim situation in which we are placed gives lot of pain and one feels helpless and suffocated. Once caught in this quagmire, one is left with two options to put on blinkers or to take heed and try to work for the redressel of these problems. The present woke is infact a step in this direction where I want to divert the attention of all stakeholders to awaken and fulfill their responsibilities before it is too late for us to make good the loss. History has placed us at such a cross road that we have to act, stop passing on the buck and watch our steps with the global march of development and prosperity.

The state of Jammu & Kashmir needs more attention in the areas like Agriculture, Education, information technology, Health, Unemployment, Tourism, traffic regulation etc, so that we can be at par with the rest of the world, there is a great need for the growth of the Jammu & Kashmir state. If we will take agriculture for instance time will come when we have everything but not food because of large-scale constructions on paddy land. The agriculture here also needs upliftment in terms of modern tools and technology so that better results can be obtained in less time, we need to explore the talents of the youth and exploit the agricultural resources for the better development of the state, we have lot of potential here but it needs to be chanalised in proper way, we have entered an era of information society and knowledge based economy, people all over the world live with one world concept, internet has shrunk the world together. To run this revolution we need ambitious minds, minds that will lead us to tomorrow's world and we should be part of the communication revolution to be effective in tomorrow's world, but the state of Jammu & Kashmir is not on the map of information technology world as yet we have to do our best to take J&K State to new heights. Because there is never a wrong time to do a right thing. We shall pass through this world once as every body has got his return ticket and we all are adhoc here. We should not be among those who believe in what cannot be cured must be endured . God has created us for some purpose and nobody will be like us , we are unique and we are part of God's power. Impossible says I am possible and those who will board the boat will ultimately reach the shore, but those who will stand on the shore will reach nowhere, as there is no short cut to success because our tomorrow depends upon the choice we make today.

This books invites attention of the state Govt. of Jammu & Kashmir in terms of importance of agriculture, horticulture, information technology, education policies, unemployment problems, tourism, traffic situation, role of private sector.

Many educated youth are getting depressed due to unemployment and this stress has led to another problem of drug addiction. Another major problem in our state faces is the loss of culture. Our young generations are getting attracted towards western trends of life. We have devalued our culture always to perform best in all sphere of life. Which cannot be express in words.

I am very thankful to Javed Iqbal, Deputy Director (Radio Kashmir), Prof. A.R. Rather, (H.O.D psychology), Mehraj-ud-Din (Add.Controller Examinations), Dr. S Mufeed (Mgt. Studies), K.U, Prof. N.A.Nadeem, Prof. Khursheed Ali (Former Dean Academics, K.U) & Prof. K.K.S.Jamwal, Mr. Masood & Nasir Mirza for their help.

My grateful thanks are due to Mr. Zameer. Mrs. Masooda Rajpuri Registrar Academics SKIMS & Dr. Tusoo additional Professor SKIMS for their support and encouragement.

I am also thankful to M.S. Mattoo, Fayaz Wani, Javid Malik, Aurangzeab., Parvaiz A. Bhat for their great contribution in giving valuable suggestions. I am also thankful to G.H. Kaloo, who is my mentor and inspiration.

I would like to thank, M.A.Gora (Registrar (SKAUST/K) for his kind cooperation. I would like to thank Prof. Anwar Alam Vice chancellor SKAUST/K who is a visionary and professionally cum Administrator of higher order for writing foreword to the book.

Finally I express my gratitude to all the eminent authors/contributors for their excellent contribution, without their contribution my dream would not have come true.

Srinagar January 2007

Riaz A. Patloo

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NEW LIFE ALL TOGETHER

By: Riaz A. Patloo

Today we feel proud talking about the internet, internet will soon be a story of yesteryears. To run this revolution in the state of Jammu & Kashmir we need ambitious minds, minds that can lead, every body knows information technology is changing the way the world handles business goods and services can be developed, bought sold and even delivered over electronic networks. This will give the average businessman a much bigger market to play in. today it is possible for a customer to access information, select product, order them and make payments on line communication in formation product delivery and payment mechanism are the basic ingredients of e-commerce payment on the internet can be made through two basic banking products credit cards and saving or current accounts. Many countries have got a website which purports to give citizens various facilities one can apply for a ration card on it or even a driving license. Corruption can be stopped with the help of information technology because speedy transaction can reduce the scope for corruption. The second cause for corruption is lack of transparency a customer does not get to know what his rights are and how his case is being handled.

To make a website it really means to open an office on internet, which will remain open for 24 hours even when we are sleeping or dreaming. Ideas are becoming more important than assets. We can use information from technology for teaching not only the class which is physically present, but also teach a large number of students over long distance through a computers network and technologies like video conferencing, books converted into multimedia CD's can bring the world of knowledge to students in the remotest part of the country at an affordable cost.

The biggest challenge for us today is to make our society realize that technology is nothing but a very effective tool and the magic is in how we use it. As we move into the digital world that is increasingly competitive and interdependent, the need for revamped education system to service is becoming eve.

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More critical, one should use technology as a revolutionary force that will transform education into an important and effective means of securing our future.

The huge usage of the web provides a rich learning resource of all those who have an access to it. Internet is creating a platform for independent low cost communication infrastructure which permeates all sectors of the economy and is providing an affordable medium for conducting business. If we show speed imagination and excellence in execution and finally if we harness the power of youth, the future is about youth energy and enthusiasm, if we do not realize this will be cut off from rest of the world like dew on a sunny morning.

Today internet is another medium of communication like the messenger, newspaper, the telegraph, the telephone, radio, television. It has made one to one communications a reality, every morning it has given us a chance to shop on line and talk to people world wide at a fraction of the cost of traditional means of communication. The internet is leading to the growth of a new economy – the economy with e-cash, e-cheques internet is playing very important role in also shaping the human minds. This century is going to be dominated by I.T, but the questions is now, how will life style change with the change in technology? Will people spend more time at home? Will people work in offices or operate from homes? Will human beings become more socailable or less?

There are many other living in remote villages of J&K who do not realize that this technology is relevant to their lives. We need to reach out to them and let them know how they should care how new technologies can open new opportunities for them and their children. In Western Europe business are using the web for e-commerce, even if J&K takes a tiny share of business e-commerce volumes add up to a substantial. The question is how to regulate this business. How to earn revenue by taxing e-commerce and at the same time how to keep such taxes low so as to attract business traffic to J&K. The world is coming close day by day because of internet. Let's not lag behind in this race. The J&K state is not at par with the rest of the world as for as internet world is concerned. Industries have been deregulated monopolies broken and competition welcomes. Communication technologies from the plone to the email have shrunk the world. In the sate of Jammu & Kashmir we can really take advantage of the changes that are coming in with the new economy in the future. I) we can access international consumers ii) we can access international companies, we can use technology to improve our operations in the first two cases. III) We would need to go to whole distances on adopting technology to be able to compete with the world, but as far as third instance is concerned we can adopt technology that gives use a competitive edge in the local market, industries in the state of Jammu & Kashmir should changing the way many of us work communicate purchase goods and obtain information. In our state of Jammu & Kashmir information technology will come on stream to help hundreds of millions of very different people understand the need for common actions & common constraints because the telecommunication and the internet revolution knit the world together.

STATUS AND PROSPECTS OF AGRICULTURE IN KASHMIR

Anwar Alam
Vice Chancellor SKAUST (K)

Agriculture is the predominant sector in the economy of Jammu and Kashmir State and would continue to be the major source of income and employment due to limited resource endowments in other sectors. The state has a net geographical area of 10.14 Mha excluding the area under the occupation of Pakistan/ China. The State is characterized by four distinct physiographical zones viz. sub-tropical, intermediate, temperate and cold-arid zone and, as a consequence, generates a wide range of macro- and micro-climatic situations suitable for raising a variety of crops and livestock species. The elevation of the State increases as we proceed from south to north, ranging from 330 m in Jammu to about 6000 m in trans-Himalayan region of Ladakh. With increasing elevation, the average rainfall decreases from 1115 mm in Jammu region to 650-1000 mm in Kashmir region and only 92.6 mm in Ladakh region. The physiographic situation also determines the length of the crop growing season. In Jammu region the crop can be grown round the year, while in Kashmir valley *Kharif* is the dominant cropping season with possibilities of the Rabi corps but in Ladakh region crop cultivation is possible only during June-September.

The agriculture and its allied sectors provide about 36 per cent of the net domestic product and engages about 80% of the population. The net domestic produce increased from Rs 1049.5 crores at 1980-81 constant prices index to Rs. 8062-8 crores during 2001-02, while the per capita income increased from Rs. 1776 to Rs 7841 in 2001-2002 (Table-1).

Prof. Anwar Alam is presently working as vice Chancellor Skaust(k)

TABLE 1. GROWTH IN NET STATE DOMESTIC PRODUCT AT 1980-81 PRICES

Year	Net state domestic production (Rs. Crores) Income (Rs.)	Percentage share of different sectors			
		Per capita	Primary	Secondary	Tertiary
1980-81	1049.50	1776	47.40	12.90	39.70
1990-91	1359.89	1784	38.49	16.81	44.70
2000-01	7396.79	7384	36.74	12.04	51.22
2001-02	8062.81	7841	36.34	14.11	49.54

The agarian structure of the State is dominated by marginal and sub-marginal holdings and limited scope for further expansion of cultivable land. Factor productivity has declined due to set crop rotations and limited investment in augmenting the productive potential of farm holdings. Degradation in natural pastures has reduced their carrying capacity, particularly due to colonization of poisonous weeds in alpine and sub-alpine pastures. Growth in livestock husbandry has been hampered particularly due to feed and fodder shortages. This has resulted in large scale import of sheep and poultry from adjoining States and adversely affecting State's economy. Livestock rearing and fruit and vegetable cultivation are parallel activities for small and marginal farmers and every enterprise shall have to be dovetailed in a farming system approach and application of modern science and technology to bring about a complete rural transformation in the State.

AGRICULTURAL PRODUCTION

Land resource utilization pattern of J&K State indicates that 82% of the area is not available for cultivation and of the 18% net geographical area being used for agriculture and other allied activities, net sown area accounts for only 7.36 % of the net geographical area. (Table 2). Agriculture sectors during the post-independence era has shown considerable transformation, whereas the net sown area has increased from 0.614 Mha to 0.736 Mha during the last more than 50 years. However, there are environmental and topographical constraints which do not permit full utilization of available land resources for agriculture year around.

TABLE 2. LAND RESOURCE UTILIZATION IN J&K

Classification	Area (Mha)	%of Revenue records area	% of geographic-al area
Total geographical area J&K (Surveyor General of India)	22.2236	–	–
Area under Pak occupation	7.8114	–	–
Area under Chinese occupation	4.2735	–	–
Net geographical area of J&K	10.1387	–	100.00
Area on Revenue Records	2.4160	100.00	–
Not available for cultivation	8.3099	–	81.96
Not available for cultivation (revenue Record)	0.5820	24.09	5.74
Area under forest	0.6580	27.23	6.49
Uncultivated land including pasture	0.339	14.03	3.34
Fallow	0.090	03.73	0.89
Net area sown	0.747	30.92	7.36

Increase in area, production and productivity of major food crops has been observed over the years (Table 3) but the rate of development has been slow. Similar trend has been observed with fruit crops and livestock husbandry. Cropping intensity in Jammu region in 176.8% whereas it is only 123% in Kashmir and 106% in Ladakh region.

TABLE 3. FOOD GRAIN AREA, PRODUCTION AND PRODUCTIVITY IN J&K (2003-04)

Total area under cultivation (lakh ha)

	State	Jammu	Kashmir	Ladakh
Rice	2.60	1.27	1.33	–
Maize	3.21	2.16	1.05	–
Wheat	2.55	2.50	0.01	0.04
Pulses	0.28	0.182	0.09	0.008
Oilseed	0.63	0.18	0.45	0.0007
Total (major food crops)	8.64	6.11	2.48	

Production of food grains (Lakh tones)				
Rice	5.05	2.00	3.05	–
Maize	5.32	4.14	1.18	–
Wheat	4.54	4.54	0.001	0.004
Pulses	1.30	0.84	0.48	0.050
Oilseed	0.42	–	–	–
Average productivity (q ha^{-1})				
Rice	19.43	17.48	20.96	–
Maize	16.59	19.13	11.31	–
Wheat	18.03	18.21	9.90	–
Pulses	5.01	4.79	5.24	6.25
Oilseed	6.68	–	–	–

Though the cropping pattern is dominated by food crops, yet the State is deficient in food grains. The import of food grains year after year is suggestive of the fact that modernization of agriculture is imperative if the State has to achieve self-sufficiency in food grain production and ensure food and nutritional security of its people. It is to be recognized that food grain requirement for the estimated present population is of the order of 1.97 Mt, whereas the production is 1.62 Mt, a net deficit of 0.35 Mt. Besides, surplus corm and oilseed cakes would be required for pelleted animal feeds to promote livestock and poultry production and reduce the import burden.

CEREALS

Rice

Yield levels created, obtained at University experimental farms are 6-6.5 t ha^{-1} of paddy in the valley whereas State's average productivity is around t ha^{-1}. The potential high yielding varieties developed by the University are given in Table-4. Some farmers report yield levels of 5-6 t ha^{-1} of paddy. In higher altitudes, the yields are relatively lower.

TABLE 4. RICE VARIETIES RELEASED BY SKUAST-K

Variety	Suitability	Salient features	Remarks
Jhelum	Lower belts of Kashmir Valley below 1650 m asml.	Medium tall, erect compact plant, awnless, bold grain, Non-scented, non-glutinous, yield 6-6.5 t/ha of paddy	Moderately susceptible to blast
Chenab	Lower belts of Kashmir and mid elevations of Jammu	Medium tall erect compact plant intermediate flag leaf and medium bold grain, non-scented, yield 6-6.5 t/ha	-do-
Kohsar	Higher belts of Kashmir Valley	Cold tolerant, easy threshability, non-shattering, yield 4-4.5 t/ha	-do-
Shalimar Rice-I	Lower belts of Kashmir Valley	Early maturity, bold grain, non-scented, high yielding 6-7 t/ha, fertilizer responsive	Tolerant to blast

In order to increase rice production in the valley, following key interventions are recommended:

1. Grow variety released by the University using quality seed and recommended package of practices.
2. Paddy nursery should be raised under low polythene tunnel to avoid low temperature damage.
3. Application on additional does of N @ 40 kg ha^{-1} a week after flowering
4. Application of P_2O_5 @ 60 kg ha^{-1} to both Kharif and rabi crops
5. Regular application of K_2O (muriate of potash)
6. Zn as ZnSO4 (15 kg ha^{-1})
7. Direct or drum seeding can reduce unit cost substantially.
8. System of Rice Intensification (SRI) can be practiced with economic advantage

Maize

At higher altitudes/ hill slopes, rainfed maize is widely grown as staple food. Released varieties of SKUAST-K (Table-5) have yield potential of 5-6 t ha^{-1}. Being unirrigated crop, average productivity is reported to the tune of 1.59 t ha^{-1} at the farmers' field. Shalimar Maize KG-1 and Shalimar Maize KG-2, with a yield potential of 4-4.5 t ha^{-1} have been found ideal for cold hills in high altitudes. Hybrid maize also shows promise but the seed production is difficult. For taking good crop of maize, proper agronomic management is taken of weeding, productive irrigation and adequate application of nutrients particularly N,P,K and Z are important considerations.

TABLE 5. MAIZE VARIETIES RELEASED BY SKUASYT-K

Variety	Suitability	Salient features	Remarks
C-8	Lower belts of Kashmir and higher belt of Jammu	Creamy white grain Yield 5-6 t/ha Maturity in 150-155d in intermediate zone	
C-15	Higher elevations in temeperate zone	Orange yellow grain, early maturity, Yield 4-4.5 t/ha	
Super-I	Leaving Ladakh all three zones	Orange yellow grain, yield 5-6 t/ha, tolerant to turcicum blight	
Shalimar Maize KG-1	Cold hill areas	Extra early, yield 4-4.5 t/ha Tolerant to leaf blight	For Gurez, Machil etc.
Shalimar Maize KG-2	-do-	Extra early, Yield 3.5 to 4.00 t/ha, tolerant to leaf blight	-do-

Wheat

Wheat is predominantly cultivated in Jammu region (2.50 L ha), whereas only about 1500 ha are under cultivation in the traditional wheat growing belt of the Valley. Varieties have been identified and developed with a yield potential of 4-5 t ha^{-1} that particularly include Shalimar Wheat-1, HS-240, HS-365, HS-295, VL-738 and HPW-151. Efforts need to be made to introduce Rice-Wheat crop rotation that can remove food grain shortage and mitigate fodder crisis. The University has succeeded in raising wheat following rice and having a week's time for preparing seed bed and transplant rice using Shalimar rice-1 and Shalimar- wheat -1.

PULSES

Among pulses, rajmash, lentil, moong, pea and cowpeas are important. Native germplasm of rajmash is rich and rajmash of Baderwah area sells at premium price in Delhi markets. However, area under pulses production has steadily declined resulting in the decrease in production as well. Pulses occupy 0.18 L ha in Jammu, 0.09 L ha in Kashmir and just 0.008 L ha in Ladakh region with average productivity of 0.5 t ha^{-1}. SKUAST-K has developed HYVs in different pulse crops (Table 6) suitable for Kashmir region. Their cultivation on a large scale could augment the requirement of pulses to a considerable extent. Productivity of pulses, the main source of protein to vegetarian people, can also be increased by application of *Rhizobuim* culture (alongwith PSB and VAM), recommended doses of fertilizer (NPK), manure, protective irrigation and weed management. Raised bed planting gives better plant stand and protection against water logging, especially during winter.

TABLE 6: VARIETIES OF PULSES RELEASED BY SKUAST-K

Variety	Suitability	Varietal features
Shalimar Rajmash-1	Pulse growing areas of Kashmir	Semi-erect, medium maturity, uniformly deep red kidney shaped seed, yield 11-12 q/ha
Shalimar Masoor-1	Rainfed areas of the Valley	Erect plant, white flowers, amber pink bold seed resistant to root rot, leaf spot and bold blight, yield 8 q/ha
Shalimar Cowpea-1	Rainfed areas of the Valley	Intermediate growth, climber bleak oval shaped grain, yield 8-8.5 q/ha

OILSEEDS

Mustard oil is very important cooking medium specially for mutton, chicken, fish. Brown sarson (*Brassica campestris* L.) is the most important oilseed crop cultivated in Kashmir Valley where it occupies 0.45 L ha with an average production of 6.68 q ha^{-1}. Infact J&K is the only State where this species of *Brassica* is grown and other strains of rapeseed-mustard do not do well in the region. Researchers have identified hybrids in Brown sarson and they need to be evaluated under Valley conditions prior to their introduction. It is also essential to develop high yielding varieties of Brown sarson since only two varieties, Gulchin and KOS-1, developed by the university are currently available. There is also urgent need to conduct research for improved management practices that enable us to harvest upto 1.5 t ha^{-1} of oilseed. Possibility need to be explored for introduction and cultivation of other better quality oilseeds particularly sunflower and sesame.

FRUIT CROPS

Fruit crops are an important component of the State's economy. Temperate fruits are ecologically the niche crops of Kashmir. The average productivity of fruit crops has improved from 1.3 t ha^{-1} in 1953-54 to 5.15 t ha^{-1} at present but is still much lower than the potential. Apple, walnut and almonds rank first, second and third in terms of area under cultivation in Kashmir. Other notable fruits include cherry, plum, peaches and apricots although prospects do exist for other nut crops, strawberry and kiwi fruits etc.

SKUAST-K has released three varieties of apples – Akbar, Shireen and Firdous, two varieties of walnuts-Hamdan and Sulaiman, four varieties of almonds-Makhdoom, Parbat, Waris and Shalimar.

TABLE 7 : IMPROVED APPLE VARIETIES DEVELOPED BY SKUAST-K

S, No	Variety	Salient features
1.	Lal ambri	A regular bearer with high shelf life, organdeptic ratings very high. It has average productivity of about 20-25 t ha-1 under rainfed condition on traditional root stock 6 x 7 m spacing. However, under irrigated with density M-9 root stock etc. yields about 50 t ha^{-1}.
2.	Sunhari	A regular bearer with high shelf life and organoleptic ratings. Its productivity is similar to Lal Ambri.
3.	Firdous	Resistant to apple scab. Sub-acidic, 90-95% red colour, moderate size fruits.
4.	Shireen	It is resistant to apple scab. It is also subacidic, 60-70% red colour, medium size fruit, terminal bearer.
5.	Akbar	It is high yielder more than 50 t ha^{-1} under irrigated, 90% red, size sweet fruit. It is basically a spur bearer.

TABLE 8 : RECOMMENDED APPLE PLANTING PRACTICES RECOMMENDED BY SKUAST-K.

S,No	Root stock	Spacing (m)	Plants ha-1
1.	Crab/Maharaji	6 x 6 – 7 x 7	277 – 305
2.	M-9	2.5 x 3 - 3 x 3	1111 – 1666
3.	M-4, M-26, M-7, MM-106	4.5 x 4.5	555

Massive nursery raising programmes are needed to promote high density orcharding and popularize superior varieties available. CITH has collected rich germplasm which needs to been exploited for further improvement in quality and productivity. Disease and pest management issues have been handled and control measures evolved. However, codling moth has become a menace in Leh areas requiring cost effective control measures. Kiwi and olive have been introduced and doing well. Pistacho, Pecan nuts, Hazel nuts, Chilgoza have potential requiring R&D efforts.

TABLE 9. ALMOND AND WALNUT VARIETIES RELEASED BY SKUAST-K

a) Almond

1. **Shalimar** : Mid bloomer, semi-soft-shell, average yield 2-5kg/tree or 6.75 q\ha (unshelled).
2. **Makdhoom** : Late bloomer, semi-soft-shell, 2.50 kg/tree or 6.75 q/ha (unshelled) yield
3. **Waris** : Late bloomer, semi-soft-shell, 2.41 kg/tree or 6.50 q/ha (unshelled) yield
4. **Parbat** : Mide bloomer, soft-shell, 1.72 kg/tree or 4.64 q/ha (unshelled) yield

b) Walnut

1. **Hamdan** : Light coloured kernels, high shelling percentage (>54%)
2. **Sulaiman** : Light amber coloured kernels, 52% shelled

Cherry is an important and delicious fruit crop of Kashmir which has monopoly in India. However, its area is limited (2531 ha) with annual production of 7308 t and average productivity of 2.89 t ha^{-1}. It is a fruit with very short shelf life of about 7d. Gummosis is widespread and lot of fruit is lost due to cracking in the event of untimely rain. Table 10 gives the varieties raised in the Valley.

TABLE 10 : CHERRY VARIETIES RAISED IN KASHMIR VALLEY

1. **Double** : Larger fruits with dull colour, shelf life are relatively larger.
2. **Mishri** : Dark red colour sweet fruits

3.	**Makhmali**	: Datrk red colour sweet fruits
4.	**Awwal**	: Early maturing

Efforts are needed in importing promising strains for adaptation and improve cherry management to increase productivity. If the shelf life is doubled marketing will be easier.

Apricot, is major fruit crop of Ladakh region and also raised in the valley. It has wide adaptation, grows all over J&K except Jammu and Kathua district. Skardu areas of Pok has rich biodiversity in apricots and some of the varieties are known for their quality. Traditional cultivars are mostly cultivated.

TABLE 11. APRICOT VARIETIES RAISED IN KASHMIR DIVISION

1.	**Charmagz**	: A sweet apricot cultivar raised in the valley, pulp and kernel both sweet, kernel used as almond substitutes.
2.	**Kaisah**	: A sweet apricot cultivar raised in the valley.
3.	**Gilgati Sweet**	: Sweet apricot from Gilgit region raised in Kargil locally known at 'Bota Cher'
4.	**Helman**	: Sweet apricot widely grown in Kargil region, possibly of Afghan origin.
5.	**Khantae**	: Wild apricot having sweet pulp but bitter kernel widely grown in Leh and Kargil. Kernels are used as oilseed.

Sulphiting and osmodehyderation yield attractive colour in prunes. Solar dryers and suplphiting technique developed by SKAUST-K and Osmodehydration developed by RRL Jammu need to be promoted to preserve this highly perishable nutritive fruit for better economic dividends. Wild apricots are good for soil conservation and can be raised on hill slopes and undulating areas. Its leaves are good feed to sheep and goats and the wood has several economic uses, kernel oil is considered of medicinal value, stems yield edible gum etc. At present apricot productivity is very low, efforts are on to increase productivity of apricots.

Suggested remedial measures to increase productivity of horticultural crops include the following :-

Short-term measures :

1. Plantation of high yielding, regular bearing varieties grafted on clonal root stocks, preferably high density plantation using dwarf root stocks with fertigation.
2. Plantation of pollinizers (Golden Delicious, Sunheri and Red Gold) in recommended ratio (30%) and pollinators (2-3 beehives per hectare).
3. Integrated Nutrient Management, balanced fertilizers as well as organic manure, micronutrient supplements as foliar sprays.
4. Moisture conservation in tree basins in rainfed areas with the help of plastic or straw mulch. Fertigation gives best results.
5. Orchard trees should be properly trained and pruned depending upon their fruit bearing habit.
6. Dead trees should be replaced with new plantation and seniles rejuvenated by top working, pruning and fertilizer application. \
7. Developing network of improved nurseries of selected fruits for serving as mother orchards and supply of planting material.
8. Diversification of apple replacing Red Delicious with the hybrids available, disease resistant and high yielding varieties.
9. Development of fruit based cropping systems, intercropping with compatible vegetables, saffron, legumes and MAP especially during juvenile period.
10. Adhering to spray schedule to control pest and diseases.
11. Modernization in packaging storage, transport, processing and value addition.
12. Intensification of extension activities through training ands demonstrations.

Long-term Measures

1. Plant breeding for yield, quality, biotic and abiotic stress resistance.
2. Agro-techniques that increase productivity and reduce unit cost of production, enhancing profitability.

3. Establishment of Model Nurseries
4. Establishment of Budwood banks of promising cultivars.
5. Introduction of fruits suitable for processing.
6. Establishment of disease monitoring & forecasting systems.
7. Database on fruit crops.
8. Diversification in fruit crops, introducing remunerative, long shelf-life fruits and nuts in demand.
9. Development of infra-structure for safe storage of fruits and nuts, primary processing and value addition infrastructure in the production catchments to minimize losses and increase profitability to the growers.

VEGETABLE CROPS

Climate is well suited for wide varieties of vegetables, leaving winter months in the Valley. Cabbage, cauliflower, knol khol, turnips, carrots, capsicum, chillies, brinjals, watergourd, bittergourd, tomatoes, okra, kale, spinach etc. do very well. SKUAST-K has developed varieties in capsicum, turnip, chillies as well as 6 vegetable hybrids. There are more in pipline. Vegetable seed production is good business in the State specially valley and Ladakh.

Though area, production and productivity of vegetables in J&K has improved over the years, it is still less than the developed nations. The average yield is 40 t ha^{-1} under open field conditions and 60 t ha^{-1} under protected conditions in developed countries. Average productivity of vegetables in J&K is 17.38 t ha^{-1} whereas in Kashmir it is 21.56 t ha^{-1}.

TABLE 12. AREA UNDER VEGETABLE PRODUCTION AND PRODUCTIVITY BREAK UP (2003-04)

S. No.	Region	Area 000, /ha	Production 000,t	Productivity, t/ha
1.	Jammu	30.000	398.00	13.26
2.	Kashmir	26.154	564.38	21.56
3.	Ladakh	1.150	33.92	29.50
	Total	**57.304**	**996.308**	**17.38**

TABLE 13. EXPORT OF AGRICULTURAL PRODUCE FROM APRIL TO NOV. 2005 FROM KASHMIR VALLEY

S. No.	Kind	Unit	Destination		Total	Revenue (lacs Rs.)
			Jammu	Beyond Lakhanpur		
1	Vegetables	t	46730	10859	57589	5758.88
2	Vegetable seeds	t	413	956	13690	136.9
3	Potato	t	11658	1886	13544	1354.41
4	Honey	t	59	58	117	17.50
5	Fodder Seed	t	130	—	130	1.30
	Total:					7249

TABLE 14. PERCENTAGE SHARE OF AREA UNDER VARIOUS VEGETABLE CROP IN J & K STATE

S. No.	Vegetable group	Jammu Province	Kashmir Province
1.	Solanaeceous Vegetables	11.20	17.35
2.	Cole Vegetables	17.95	27.60
3.	Root Vegetables	12.45	17.65
4.	Leafy Vegetables	4.75	10.20
5.	Cucurbitaceous Vegetables	12.55	2.45
6.	Bulb Vegetables	7.50	5.45
7.	Tuber Vegetables	13.35	10.65
8.	Leguminous Vegetables	12.55	6.68
9.	Okra	6.10	0.30
10.	Others	1.60	1.67

TABLE 19. VEGETABLE VARIETIES RELEASED/IDENTIFIED FOR GROWING IN THE KASHMIR VALLEY

S. No.	Varieties/Hybrids	Year of Identification	Yield (q/ha)	Released/ identified through
1.	Tomato a)			
	Determinate			
	*Shalimar-II	1982	275	SKUAST/STATE
	Roma	—	225	SKUAST/STATE

	NDT-120	1999	260	AICVIP
	DARL-6-1	2001	320	AICVIP
	b) Indeterminate			
	*Marglobe	—	300	SKUAST/STATE
	Shalimar-I	—	375	SKUAST/STATE
	Arka Vikas	1994	400	AICVIP
	IIVR-Sel-2	2005	460	AICVIP
2.	Hot Pepper			
	*Shalimar Long	—	20 (dry)	SKUAST/STATE
	Kashmir Long-I	2001	150 (fresh)	SKUAST/STATE
3.	Sweet Pepper			
	*California Wonder	—	170	SKUAST/STATE
	Chinese Giant	—	160	SKUAST/STATE
	Nishat-I	2001	270	SKUAST/AICVIP
4.	Paprika KT-PL-19	2004	250	AICVIP
5.	Brinjal			
	*PPL Shlimar	1982	200	SKUAST/STATE
	Improved Long	1982	250	SKUAST/STATE
6.	Cabbage			
	*Golden Acre	1982	300	SKUAST/STATE
	Pusa Drum Head	1982	300	SKUAST/STATE
7.	Cauliflower			
	*Snow Ball	1982	250	SKUAST/STATE
	Pusa Katki	1982	200	SKUAST/STATE
	KT-25	2001	250	AICVIP
8.	Knol-Khol			
	Early White Vienna	1982	170	SKUAST/STATE
	Purple Vienna	1982	200	SKUAST/STATE
9.	Kale			
	Khanyari	1982	350	—
	Kawdari	1982	350	—
	G.M. Dari	1982	300	—
10.	Radish			
	*Japanese White Long	1982	170	SKUAST/STATE

	White Round	1982	300	—
	Red Round	1982	250	—
11.	Carrot			
	*Early Nantes	—	235	SKUAST/STATE
	Local Black	—	250	—
	Chamman	2001	300	SKUAST/STATE
12.	Turnip			
	*Purple Top White	1982	320	SKUAST/STATE
	Globe Nageen-1	2001	440	SKUAST/STATE
13.	Okra			
	*Pusa Sawani	1982	80	SKUAST/STATE
	Perkins Long Green	1982	100	SKUAST/STATE
14.	Cucumber			
	*Japanese Green	1982	160	SKUAST/STATE
	Long K-90	1995	250	AICVIP
15.	Bottle Gourd			
	Shalimar Improved Long	1982	400	SKUAST/STATE
16.	Summer Squash			
	Australian Green Bush	1982	300	SKUAST/STATE
17.	Lettuce			
	*Local	—	200	SKUAST/STATE
18.	Spinach			
	Shalimar Green	1982	180	SKUAST/STATE
19.	Garlic V			
	LG-7DARL-52	20012003	150100	AICVIPAICVIP
20.	Potato			
	K. Jyoti	1995	250	SKUAST/AICPIP
	K. Giriraj	2002	200	SKUAST/AICPIP

TABLE 21.VEGETABLE HYBRIDS DEVELOPED/RECOMMENDED BY SKUAST-K

Vegetable Hybrids Developed

	Brinjal	SH-BH-1	674.07	139.58	Recommended for release by RCM & ZREAC 2005
		SH-BH-2	503.70	79.68	
1.	Cucumber	SH-CH-1	1226.63	179.13	Recommended for release by RCM & ZREAC 2005
		SH-CH-5	810.64	125.24	
2.	Sweet pepper	SH-SPH-1	544.44	99.59	Recommended for release by RCM & ZREAC 2005
		SH-SPH-5	437.04	60.08	

3.	Tomato	SH-TH-1	1088.88	76.88	Recommended for release by
		SH-TH-3	826.66	34.38	RCM & ZREAC 2005
4.	Hot pepper	SH-HPH-1	268. 3	76.71	Minikit trial
		SH-HPH-2	289.4	90.50	
5.	Okra	SH-OH-3	257.8	29.00	Minikit trial
		SH-OH-7	248.9	24.00	

Polyhouse technology is better suited in J&K than other states practicing protective farming because of low temperatures. Crop is protected against insects and vectors of diseases, besides these are suited for nursery raising and vegetative propagation of planting materials of fruit crops. High altitude areas of the Valley and Ladakh can produce off-season vegetables for the plains with great economic advantage, specially those areas where protective irrigation can be provided.

FLORICULTURE

Rose, gladioli, tulips, carnation and a wide variety of other flowers and ornamental plants do well here. Polyhouses have come-up for floriculture. Dehydrated ornamental plants are having good prospects.

Himalaya represent a rich repository of diverse economcally important plant species of which medicinal and aromatic plants endemic to the State have place of pride at the national and international level. Some of the locally made medicinal plant products are- Gulkand, and Kahzaban, Khambir-e-Bunafsha, Saffron honey, Ariki--baidmushk, and Afsantheen. Rose oil, lavender oil, sage oil, artemesia oil and lemon balm oil are some of the other medicinal/aromatic plant products. These could be possible crop diversification options.

AGRO-FORESTRY

Agro-Forestry plays an important role in the State economy. The most important agro-forestry tree species grown are poplar, willow and acacia. During the year 2001 about 10 tonnes of apples produced was exported which consumed 4.5 crore cubic food of poplar wood for making packing boxes. Poplar wood is also used as structural material and in plywood industry. Willow is another tree species grown in agricultural field. Its wood is used for making cricket bats of high standards, basket making etc. leaves and twigs are used as cheap fodder for sheep and goats. It is major livestock feed in Ladakh. Acacia (I) grows very well on bunds, roadsides and barren lands. It is important feed for livestock specially sheep and goats and its wood used to make agricultural implements and as firewood.

BOVINES

Cattle, buffaloes, Yak, Zo, Zomo are the bovines of the State. Over time their population has grown.

CATTLE AND BUFFALO POPULATION IN J&K STATE

Division	1992		1997		1999		2000-01	
	Cattle	Buffalo	Cattle	Buffalo	Cattle	Buffalo	Cattle	Buffalo
Kashmir	15.05	0.312	14.83	0.40	14.74	0.32	15.15	0.30
Jammu	14.85	6.65	16.22	7.08	15.83	6.98	15.99	7.16
Ladakh	0.80	0.35	0.83	0.40	0.89	0.43	0.93	0.45
Total	30.70	7.32	31.89	7.88	31.46	7.73	32.07	7.91

Cattle population used to be about 17.6 lacs in 1956 which reached to 21 lacs in 1977 and 32.07 lacs in 2000-01. An important feature has been signifcant growth of crossbred cattle -60.32% in Kashmir, 31.20% in Jammu and 23.00% in Ladakh. Cross breeding with Jersey has become popular. Average milk yield in crossbred cattle is 4.7 kg/day against 3.6 kg/day at national level. Milk production in 2001 was 13.21 lac tonnes, 6.02 lac tonnes in Kashmir, 6.80 lac tonnes in Jammu and 0.39 lac tonnes in Ladakh. Despite over three fold increase in population from 32.53 lacs in 1951 to 99.00 lacs in 2001 milk availability has improved to 366 ml/caput/day against nutritional requirement norm of 270 ml/caput/day and national average little over 200 ml/caput/day.

TABLE 26. PRODUCTION STATUS OF VARIOUS LIVESTOCK COMMODITIES IN JAMMU & KASHMIR

S. No.	Name of the commodity	Years	Production	Source
1.	Wool	1974-75	14.75 lakh kg	
		1994-95	40.23 lakh kg	
		1999 – 2000*	67.19 lakh kg	DIP/J-753 (P) Dated 03-09-97
2.	Meat			Deptt of Information J &K and
	Mutton	1974-75	64.00 lakh kg	Deptt of Sheep Husbandry J&K.

	Poultry	1994-95	174.08 lakh kg	
		1999-	234.68 lakh kg	
		2000*	172.50 lakh kg	
		2002-03*		
3.	**Pashmina**	2001-02*	32,000 kg.	Deptt of Sheep Husbandry J&K.
4.	**Milk**	1969-70	1.60 lakh tons	
		1974-75	1.85 lakh tons	Deptt of Information Jammu & Kashmir DIP/J-753 (P) Dated 03-09-97 and Deptt of Animal Husbandry J&K.
		1994-95	7.80 lakh tons	
		2002-03*	12.54 lakh tons	
5.	**Egg**	1974-751	45 million	
		994-95	360 million	
		2002-03*	599 million	

* *Estimated figures*

SHEEP AND GOAT

Migratory sheep and goat rearing is vocation to 15% state population. Sheep and goat population in the State is about 77 lacs in the ratio of approximately 2:1, respectively. Population of sheep and goat in Jammu is about 48.5 lacs and in Kashmir including Ladakh 38.6 lac. Alpine and sub-alpine pastures are grazing grounds for these animals. Their fortune fluctuates with precipitation. Continuous drought in the State for four years adversely affected sheep and goat husbandry, decreased the wool yield by 200-300g per animal. Average wool yield in sheep raised is about 1.5-2.0kg/sheep. The average body weight reduced by 5-10kg at slaughter age. Drought causes a loss of about 100 crore. Wool and skins are not processed in the State not even at primary processing level. Kashmir is known for its *Pashmina* shawl; *Pashmina* goats raised in Ladakh yield finest and worlds' best *Pashmina Angora* goats introduced yield high quality mohair. Ladakh produces 2000kg of *Pashmina*, 90% of the *Pashmina* produced in India. Average yield of *Pashmina is* about 200g per *Changthangi* goat. Fineness of the *Pashmina* is 12-13 microns.

FISHERIES

Jammu and Kashmir has good potential for fisheries especially cold water fishery. Developmental efforts have been made in the State as a result fish production has gone up from 4277:2 t in 1965 to 18446.7 t in 2000-2001. Trout production has touched 79.2 t in 2000-2001 from 8.6 t in 1965 with the establishment of more than 37 hatcheries. Recently J&K Fisheries Department. Department has taken Initiative to culture trout under Intensive fish culture programme. There are good prospects of culturing endemic fish like *Schizothorax sp.* Mahseer- the game fish of the State needs conservation and development. Common carp and Chineas carp form major catch in the lacustrine systems while *Schizothorax* sp form major catch in riverine systems of the valley. Aquaculture practices in the valley deserve due attention.

APICULTURE

Honey production is in vogue in J&K. Quality of honey is good and it has low moisture. Leaving for a few months (January - February) where bees are given feed or migrated, plenty of flowers are there year round. Average productivity is about 15kg/hive. Studies have revealed that bees start flying at 10° C or above, and the activity is controlled by decline in light intensity. Bee abundance was directly proportional to flower density and inversely with sunshine hours. Rearing of exotic queen bee in the mustard field was better in May. Population of *Apis mellifera* decreases with the increase in distance from apiary. Abetia has largest flowering period (June-October) followed by Hibiscus and Lavender. These flowers attracted maximum number of bees, 18 and 14.4 bees/m^2 respectively.

SERLCULTURE

Sericulture continues to be important economic activity of many usually marginal farmers. SKUAST-K has developed and released three strains of silkworms which increase productivity of silk. SKUAST-K is maintaining 130 genotypes of silkworms comprising of 61 Mirgund, 20 local, 18 Mysore and Behrampur, 4 Jain, 6 Pampore and 20 evolved races. Mulbery genotypes have been evaluated and SKM-33, SKM-27, SKM-26, SKM-30 and SKM-48 have Evaluation Index (E1) of 50 and above. Their vegetative propagation under polyhouse conditions give very good results. For healthy rearing 100 ft^2 and 100 dfls of bivoltine. For climatic reasons largely single crop is taken in a year. Quality is superior but annual yields are low as compared to leading silk States that raise 3-4 crops every year.

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TRIVIALISING HIGHER EDUCATION

(Homespun model for liberalising the system)

By: Prof.M.A.Sofi

Over the years a strange spectacle has been in sight regarding the commercialisation of education which has witnessed a sea change, following the process of globalization which has spread its tentacles in almost all spheres of human activity. Whereas it is nobody's case to oppose this trend- the darker side of this trend notwithstanding- it does raise certain uncomfortable questions which ought to be addressed in right earnest if we hope to be spared its disastrous consequences for our educational system. Much though the system is already in ruins, it is still possible to salvage it from total collapse provided there is a collective will to put a stop to this unfettered commercialisation of education. The need for standing up against this trend arises from considerations of merit and excellence which cannot coexist with a culture of surfeit that is the hallmark of the contemporary trend of 'liberalisation'— a byword for throwing open flood gates for admission to higher education, without the necessity of creating/providing the necessary infrastructure at all levels. The case in point is the recent decision to start a slew of undergraduate courses in the degree colleges which are designated to be job-oriented- a proposal which appears sound, at first sight. And that is perhaps the only positive thing about this scheme. My argument against this 'novel' approach to liberalizing the system is based on my understanding of the conditions prevailing in the degree colleges where it is not possible to foster excellence mainly because of a lack of commitment on the part of a majority of teachers towards their profession. What use is the system if it fails to fire the imagination and stoke the passion for learning in a student whose creative potential either gets relegated to the oblivion or is not properly channelised, even if recognized by accident. Serious efforts are supposed to be put in place in order to evolve a system which would help shape a mind that is opened by a sense of wonder rather than one closed by heavy doses of spoon feeding and rote learning that have come to be the order of the day in the present system. The cynics would dismiss these exhortations as Utopian in view of their

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impracticability. But that is no reason why we shouldn't give it a try in the midst of a frenzy that has benumbed our sensibilities to the sordid spectacle that is unfolding before us in all its horrific dimensions.

Coming to the issue at hand, I should confine my discourse to Applied Mathematics as it concerns my own subject where, I think, I have an idea of what matters more than a mushroom growth of degree holders. The circumstances in which the idea of introducing the course on Applied Mathematics is sought to be implemented clearly shows that there is an element of undue haste in pushing through this idea even when there is no shred of evidence to suggest that the necessary groundwork has been undertaken before the proposed launching of the said course. How else does one explain the fact that it has not been found worth the bother to refer the matter to appropriate university bodies (e.g., respective Boards of Studies/ Academic Council etc.) where such issues are supposed to be discussed threadbare in terms of their advisability or otherwise. A tentative approach to such a serious issue can at best make it possible to somehow start the course without making it viable in the long run.

There is already an acute shortage of teaching staff in the colleges who cannot be called upon to run the said course, without further compromising on their commitment to teach the B.Sc. level mathematics course which has already suffered irretrievably on this count. Piecemeal approach consisting in hiring teaching assistants can merely help run the show without achieving the desired results. Proper infrastructure is supposed to be put in place in terms of the appointment of qualified / committed teachers prior to the formal introduction of the said course in certain designated colleges. It makes no sense to expect the college teachers do justice to the new course when it is common knowledge that a vast majority of them are known to engage themselves in private coaching, naturally at the expense of the class work assigned to them in the colleges. Further, the drafting of the syllabus- which the subject experts have been called upon to devise- is supposed to follow, rather than precede, the appointment of the qualified staff for the purpose which should be undertaken before the formal introduction of the course. In the circumstances, what is of utmost importance is the creation of a pool of talented, qualified and committed trainers/teachers- by now an almost extinct species- who could be called upon for the purpose. The crying need of the hour is to ensure consolidation of the existing infrastructure in the colleges as opposed to the introduction of fresh courses which, although an important component of the process of education, cannot be taken up until a threshold level of quality in education has been achieved.

It is inconceivable to expect job opportunities for those having undergone the said course primarily because there are no avenues in or even outside the J&K state where the course contents proposed to be covered under the said programme would come in handy to earn them a job. Further, the B.A./B.Sc. course is so structured that there is little scope for incorporating the quantum of syllabus beyond a point that would equip the student with the hands-on expertise to land himself in a decent job. A proper identification of the possible areas of employment in tandem with the prescription of the appropriate quantum of the course contents suitable for the purpose should precede any attempt to introduce the said course. It is only after the issues as detailed above have properly been sorted out that the launching of a course on Applied Maths. may be contemplated, preferably and more pertinently in the form of a post graduate course as is the case in other universities in the country.

In the light of the circumstances surrounding the introduction of these so-called job oriented courses including Applied Mathematics, it is not unreasonable to extrapolate that the proposal under reference is ill-conceived which is clearly bereft of vision and denuded of all traces of imagination. The baneful consequences of following a policy that is clearly adhoc and dictated more by reasons of expediency than by a genuine will to create avenues for employment are too many to reckon in detail. This thinking on the part of those who swear fealty to the cause of education, is of a piece with an equally crazy idea of introducing post graduate classes in certain degree colleges which are seen to be vying with each other to partake of the 'booty'. And all this despite the fact that they are already woefully short of the staff even for the purpose of imparting quality education at the undergraduate level which ought to be their prime concern. This is not to call into question the intentions of those who have hit upon these ideas as a recipe for redeeming the system or, for that matter, to infer that our collective imagination has run wilder while meekly acquiescing in to this and similar such proposals. I am only trying to drive home the point that their sense of priority is misplaced, if only because in a system of education that is sought to be vibrant and purposeful, it doesn't pay to merely settle for making a living after completing a degree as opposed to making a life of an individual- something that our system is just not attuned to. I am completely at a loss to understand how upon earth shall the cause of education be served when the degree colleges are merely geared to churn out under/post graduates in oodles, without a thought being spared for proper manpower planning. Those 'pioneering' these outlandish ideas would do well to realize that a system designed to produce fewer professionals through proper instruction and rigorous training is expected to be far more robust than the one where there is exclusive emphasis on things that can be counted or quantified. Nothing sums up the situation more aptly than the words of Einstein who had famously said, “Not everything that counts can be counted and not everything that can be counted counts”. That is why , I see no great prospects for a ‘highly qualified’ individual, however he may hold a degree in a ‘subject in fashion’ but has not strived to achieve excellence which, whether we like it or not, is earned only the hard way! On the contrary, he shall have no reason to suffer who has sweated his guts out in order to specialize in an area which may even be out of sync with the demands of the contemporary times. It is time we raised ourselves a little above the level of farce and did something beyond ‘academic salesmanship’ to restore semblance of sanity to a system that is literally in a shambles. The bottom line is that there are no shortcuts to excellence which is only possible to realize through dogged determination and tireless, relentless hard work.

The tragedy is that the present system which calls for an urgent overhaul is programmed to engender a climate of mediocrity rather than a culture characterized by professionalism and excellence. Here, I must hasten to add that while advocating the need for a complete overhaul of the system, it is not intended to exclude that ‘island of excellence’- the university of Kashmir ?- where there continues to be infinite scope for improvement at all levels, the NAAC A-grade notwithstanding! Pursuing policies that would perpetuate the present mess is tantamount to academic fraud for which the posterity shall have to pay a very heavy price. It is possible that we may all have contributed, wittingly or otherwise, to this sorry state of affairs one way or the other. But that does not pass muster as a reason to shy away from whatever little we can do to avert a disaster that is staring into our eyes. Coming up with such zany ideas as of starting new courses or establishing post graduate centers in the colleges is certainly not the solution but a part of the problem that needs to be addressed right away.

NEW ERA, NEW CHALLENGES: AN ATTEMPT TO STUDY

The Regional Language Press in J&K

By : Nasir Mirza

Introduction

In the context of Kashmir, 1990's saw media losing direction and in a way the very sense of purpose .The news papers continued to hit the stands but most of them were without any editorial comment. The media just reflected the turmoil that surrounded them. The newspapers became press note gazettes, carrying exclusively official handouts and press notes issued by various organizations about the situation. There was little or rather no room for any development reporting or providing any space to anything other than conflict related stories. But today, regaining what was lost; media are seen improving the content and its presentation and enhancing their credibility and utility besides expanding their horizons further and accommodating the themes relevant to various aspects of human development. In this paper an attempt is made to highlight the distinguishing features and the noticeable trends that one comes across while scanning the regional language newspapers being published in the state of Jammu and Kashmir. Here we intend to see what remains generally overlooked if not unnoticed at the national level.

So Much Bad News

The newspapers in the state are full of bad news. The news about death and destruction, atrocities and violation of human rights, corruption and crime stories dominate the news space. You pick up any newspaper the story is the same! The situation related stories, about the gun battles, encounters between militants and soldiers, protests and demonstrations, allegations and counter allegations. Scams and scandals in government departments receive good coverage while as literary, cultural, social activities get squeezed at the margins.

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Despite the limitations in terms of space and in spite of non-availability of enough number of correspondents, the newspapers of late have started giving attention to the environmental degradation in the state that is threatening the scenic beauty of the paradise on earth.

Meteoric Rise

During the period of approximately seventeen years the number of English and regional language newspapers published in the state has risen by about 500percent. With every passing day new publications hit the stands in the state.

In addition to the dramatic increase in the actual numbers of newspapers published, Kashmir also saw significant increases in newspaper circulation.

Though the Audit Bureau of Circulation (ABC) is yet to visit the state! And there are no certified circulation figures of the newspapers available as the circulation figures of the newspapers are the closely guarded trade secret of respective organisations. The data regarding the circulation of newspapers under reference are based on estimations yet they are revealing.

In 1982, total newspaper circulation in Kashmir was estimated to be around 119,000. Two years later, the circulation had risen to 192,000. In another five years, the figure was 369,000.But, by 1990; newspaper circulation dipped down quite sharply - to only 280,000, with the eruption of militancy in the state, as well as due to the flight of a considerable number of reading public from the Valley. 1992 it stood at 297,000. As per the estimated figures the circulation figures of the newspapers in the state touched 6, 08,139 mark in the year 2000. During the six years of the new millennium so far the state has seen further growth of newspapers in terms of their numbers, volume and circulation. (Source: Mass Media in India, series.).

The following update sought by this writer from the state Information Department reveals the hitherto unknown or less known facts about the newspaper industry in the state. Media seems to be attracting more than it can accommodate and the numbers are ever increasing!

As per the update, the figures regarding the newspapers in the state as on February 7, 2007 are as follows:

First, let us have a look at the number of newspapers being published from the valley of Kashmir.

English news papers (Dailies) = 13
Urdu news papers (Dailies) offset printing = 22
Urdu news papers (Dailies) lithography = 34
English weeklies = 13
Urdu weeklies (offset printing) = 14
Urdu weeklies (lithography) = 38
Magazines monthlies/fortnightlies Urdu/English = 18

Now let's see the figures about the Jammu region:

English news papers (Dailies) = 14
Urdu news papers (Dailies) offset printing = 12
Hindi news papers (Dailies) offset printing = 9
Urdu news papers (Dailies) lithography = 9
English weeklies = 10
Urdu weeklies (offset printing) = 5
Hindi/Dogri weeklies = 5
Urdu/English fortnightlies = 14
English/Urdu/Punjabi/Hindi monthly magazines = 7

Source: The Directorate of Information, J&K

Proliferation of newspapers is a remarkable feature of press in J&K. In addition to newspapers listed above, there are number of dailies, weeklies and monthlies being published at the moment but not approved by the state Information Department as they are yet to fulfil the conditions in terms of regularity, such news papers include 41 Hindi/Urdu weeklies, 31 fortnightlies in the same two languages and 8 monthly magazines in English/ Hindi/Urdu/ Dogri/Punjabi in the Jammu region. Likewise Kashmir region has an almost equal share of such publications, which are soon to become part of the regular publications and as it happens it will be a meteoric rise in the number of newspapers from the state of Jammu and Kashmir, which seems to emerge as its distinguishing feature.

Published Not Published

It needs to be mentioned that some of these newspapers referred to above are just mock newspapers having no office, no correspondents, no hawkers, and no circulation! Reportedly a few copies of these papers are printed to be part of information department files.

But the prominent ones are quite resourceful. Colour printing, Sunday supplements, a team of correspondents, coverage of politics, business, sports, besides the edit and op-ed pages, regular columns and visual elements can be described as the distinguishing features of such publications.

The dailies like **Aftab, Srinagar Times, Kashmir Uzma, Alsafa, Wadi Ki Awaz, Nidaie Mashriq, Uqab, Aafaq, Khidmat, Roshni** and **Tameele Irshad** are among the prominent daily news papers in Urdu of the state, perhaps in that order.. **Chattan** is the widely sought after urdu weekly. **Ahtisaab and Quami Waqar** are the known Urdu weeklies of the state while as The **Current Kashmir** is emerging as the principal English weekly of the state.

Dainik Kashmir Times, a sister publication of the oldest news paper of the state at the moment -The Kashmir Times, happens to be the prominent Hindi daily while as **Sangar Mal** is on the way to become the first popular Kashmiri weekly newspaper from the state while as Itlaaat, a new daily newspaper set to hit the stands soon in the state is currently available on the net.

Editorial Focus

The newspapers in the state respond to the day to day happenings at the local, national and international level by giving timely editorial comment.

The popular daily, Srinagar Times has the distinction to comment on the most important

development generally related to the state on the same day in the very next issue. The timely topical edits show the professional capabilities of the leader writers and also guide the public opinion on the issues of vital concern.

An editorial in Srinagar Times focussed on the Hurriyat boycott of the roundtable conference and observed that such conferences only added to the hardships of common.

People as all activities come to a standstill due to security concerns.

In its editorial recently Aftab observed that though the coalition government had completed four years in power, it had failed to provide clean administration to the people. The editorial painted a dismal picture of the economy and the political situation in the state and blamed all political leaders for the hardships faced by the people.

In its editorial on yet another date Srinagar Times observed that opposition parties in Kashmir were always seeking to undermine the ruling party. The editorial observed that revelations made by Dr. Karan Singh about the fact that scandals began in India when V. P. Singh was the prime minister and Mufti Mohammad Sayeed was the chief minister and the endorsement of these observations by the National Conference clearly indicated that opposition parties were always trying to tarnish the image of the party in power.

Even-Handed Reporting

Most of the news papers under reference try to accommodate all points of view while covering the situation. Its is a difficult and delicate task they perform so skilfully almost every day. It is akin to tight rope walking or rather walking on water! While doing the even-handed reporting, they try to give fair-minded, in a way non-hypey exploration of the ever-changing situation in the conflict area they cover.

No Corrections, Please!

On the one hand we find the credible news papers in the state making a conscious effort to ensure fair dealing and to present all sides of the picture to the extent possible. However, strange it may sound, they seem to stick to their guns even when enough evidence is submitted by the aggrieved party that their reporter has erred on some account. For denials there is no space available on the front page, even if the original story may have appeared on page one itself. Some newspapers maintain the distinction of not entertaining any denial, and just do not like to grant the right to reply to the concerned, forcing the aggrieved persons at times to insert paid advertisements in the same news papers to set the public record right.

Current Concerns

In 2006 the infamous sex scandal in which highly influential politicians, bureaucrats and security personnel were allegedly involved hogged the headlines.

In 2007, the stories of fake encounters reportedly staged in the past have surfaced and the news papers are highlighting the issue and the response of general masses there in.

A recent development is the attention being given to environment related news. the pollution of water bodies; especially the condition of world famous Dal Lake is almost a daily subject in the regional newspapers in valley.

Democracy, human rights, economic development, communal harmony, social cohesion, political consensus besides unity in diversity are the popular themes of the programmes presented by the Radio Kashmir and Door Darshan Kendra Srinagar in the regional languages. However quality of most of the stuff being dished out by the official media leaves many things to be desired.

However, credit goes to Ashraf Sahil,the then Station Director Radio Kashmir and Ms Nayeema Ahmed Mehjoor the then producer for launching a news magazine programme, Shehr Been, mostly covering issues related to development. The programme because of the professionalism exhibited by the concerned became popular over night and today one sees the concerned making serious efforts to maintain its popularity. The Prasar Bharti authorities have taken note of the popularity of the programme and are so impressed that directives have been issued asking the other stations of the All India Radio else where in the country to take the cue and start Shehr Been type programmes.

It is pertinent to mention that whenever media raises the issues especially related to development, it does attract attention of and action by the concerned authorities. Stories on deforestation, smuggling of timber carried by **Shehr Been** led to plugging of routes and ensured curbing of the loot of green gold.

The 'demolition drive' initiated by the state govt when Mufti Mohammad Sayeed was the Chief Minister to make Srinagar free of encroachments received whole hearted support of the media, be it Urdu press or English dailies and weeklies. The press while highlighting the genuine demands of rehabilitation of the affected shopkeepers called for all out support to the beautification plan of the state government.

"Brain drain" costs developing countries billions. Our state is no exception. Turmoil only further aggravated the problem. Hundreds if not thousands of doctors, engineers, technocrats, professionals in other fields have moved to greener pastures mainly because of the not- so- conducive and congenial atmosphere back home. They do earn revenue for the country but make their respective societies intellectually poorer and socially barren. However it is heartening to note that our local press is mindful of and sensitive towards the crucial issue. The regional language newspapers carried several stories on the professionals who have migrated to other countries in the recent past.

The media support and the resultant public support encouraged J&K Bank to spend Rs Two Crore to transform a cesspool into a beautiful park in the uptown Srinagar dedicated to the memory of the famous philosopher poet, Dr Sir Mohammad Iqbal. The appreciation that the bank received is an indication of the fact that the heart is at its right place and every thing has not gone with the wind.

One of the most popular Urdu daily of the valley, Alsafa earned appreciation for carrying a series of write ups on the need to restore the pollution free environment of the valley. The same news paper carried stories of sexual harassment of some working ladies at the hands of their male colleagues which led to initiation of departmental inquiry in the sorry state of affairs.

The largest circulated daily of the valley, Aftab is continuously and courageously leading the campaign for social reform in the valley. Aftab has the distinction of having given whole hearted support to many social reform movements launched by the concerned citizens here from time to time. Editor Aftab ,Khawja Sanna ullah Bhat ,the pioneering genius of Kashmir press, is leading a crusade against the social evils, rampant corruption in society ,decay and decline of institutions. The other development related issues that seem to catch the attention of the editor are pure drinking water to the people, quality education, proper healthcare arrangements especially for the poor, and jobs to the youth and respect to women.

Another popular daily Srinagar Times has been supporting literary activities in a big way. Sofi Gh Mohammad Editor Srinagar Times, also

Member J&K Legislative Council, has a dream project to extend financial support to local writers, poets and authors. On account of constituency development fund ,he intends to promote literary activities, writing and publication of books on literary and scientific themes and wants to extend all possible support to writers whom he considers ‘ his constituency’. “Language is no bar but the selected works whether in Kashmiri, Urdu, Hindi, and English should have been authored by sons and daughters of the soil.” said Sofi Gh Mohammad in an informal chat with this writer in the recent past. The literary competitions and quiz programmes provide a rare opportunity to the readers of Srinagar Times to test their level of knowledge, comprehension and communication skills.

Urdu weeklies **Chattan, Khabr-o-Nazar** and **Ahtisaab,** and dailies like **Uqab**, **Nidai Mashriq** , **Aafaq** do carry informative and thought provoking articles by scholars. Week after week, the **Chattan** gives an in-depth analysis of the complex political situation in the state. Occasionally though, one does find research based articles and well written editorial comments on culture, language,and society as such in various newspapers published from the state sensitizing readers about various aspects of human development.

Ownership Structure

In the state the daily Aftab is perhaps the only popular newspaper owned by a trust .Rest of all the news papers have proprietor-editors. The newspapers are generally known by the name of the editors and vice versa.

Paid News and under paid Journos

On the one hand the journalists, especially those working for regional language news papers, in the state get paltry sums in the name of salary, while as on the other hand one of the interesting features of press in the state is the “paid news”. The news papers with out exception present the stuff which is otherwise the subject matter of advertisements highlighting the PR exercises by the interested parties and individuals, in the shape if the news stories reportedly after they pay the fee.

Delivery System

The concerned circulation managers of the valley based news papers are yet to evolve an efficient delivery system for the distribution of their respective newspapers across the length and breadth of the state. However it is noteworthy that the management of the daily Kashmir Times and its sister publication Dainik Kashmir Times is using vehicles to ensure that their newspapers are available on the news stands in Srinagar along side the news papers published from valley .

E -Paper

The state is yet to have an e newspaper and the moment certain newspapers are exploring the possibilities of launching an e-paper and are conducting surveys asking readers if they would be subscribers for the proposed e-papers. However, all the major news paper in the state have an on line version.

The Revenue Model

The revenue model for newspapers in the state is based on a mixture of advertisements, Paid subscriptions, and classifieds. Advertisements, mostly from the government departments issued through the Information Department are the greatest source of revenue, while smaller dailies and weeklies may rely on small business and classified ads. Paid subscriptions are usually second or third in the revenue scheme. The government, as per reports, uses the advertisements as a means to ensure enhanced coverage of its activities.

The writing style

The writing style of newspapers under reference tends to be formal and concise and at times too brief. Story formats are usually inverted pyramids for hard news stories and slightly more conversational for soft news features. The limited space comes in the way of a detailed account that at times one feels should have been given of an incident .Stories are generally given within a range of words or inches to fit a certain space.

The front page of the newspapers appears quite crowded wherein stories appear in dense blocks of text arranged in columns across the paper with photos, advertisements, and other graphics leading the eye around the page. To maximize the number of headlines to hook readers, whole stories are almost never printed on the front page - we see a headline, the beginning of a story, and then the reader must follow the story as it "jumps" to continue on another page. It is a Herculean task to find the rest of the story in the inside pages! The rest of the paper we find more organized as the stories are arranged by topics, such as news from the various regions of the state, subcontinent, Middle East, editorials, entertainment, literature and sports, with section fronts showcasing the most important news on each topic. Of late some newspapers have started using the services of ace graphic designers to organize the content in a page with a professional touch.

These are the nationally unknown or least known facts about the unsung or least sung heroes of Kashmir press, something that should be considered while assessing the role Kashmir press plays in rebuilding the society on healthier lines.

However, the coverage, content and presentation are in no way adequate or exemplary. A lot more needs to be done to meet the challenges and demands of the contemporary times.

THE ROLE OF THE MEDIA AT GLOBAL NATIONAL AND LOCAL LEVELS IN CONFLICT SITUATIONS.

Abdal Mehjoor
Radio Kashmir Srinagar.

One of the great marvels of the 20th century has been the world-wide emergence of the media as the cornerstone of public life and civil society Although, the roots of Journalism can be traced to the **Crimean War** of the mid 19th century, when Journalists from Britain went to the **Crimean peninsula** to report on hostilities, it was not until the later half of the 20th century that the profession of the journalist and broadcaster began to take definite shape. The way politics was conducted and the way people through about politics and world affairs would never be the same again. The media revolution brought a whole raft of changes in people's attitudes and ways of life, all on an unprecedented scale. It is now considered to be one of the essential requirements of a healthy democracy that there be a free and fearless media that ensures the unhindered formation of public opinion. The focus of this paper is to examine the scope of the roles that the media has taken on in today's swiftly changing world. A good starting point is to look at the way in which the media has evolved and the processes and events that gave shape and direction to this evolution. It is useful first of all to establish the functions that the media fulfills in society. The first function can be called the entertainment function. Radio, television and newspapers are there to entertain us. To provide us good programmes that cater to the vast range of tastes the people served by these institutions have. However, an equally important function is to inform and educate us. In an increasingly

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Abal Mehjoor is presently working as incharge programme Shaharbeen Radio Kashmir Srinagar close knit world, It has now become second nature for every person to know the events and happinings in the world through media. From the sickle-wielding peasant of Kashmir glued to his transistor set to the top-flight business-executive on wall street stuck to his computer everyone nowadays feels the need to keep up-to-date with the world. One can no longer afford to be unaware to the ground-breaking events that now take place at a much greater frequency than in the past. It is against this backdrop that we should look at our topic of inquiry.

The world today is engulfed in a number of conflicts and wars being fought out in every region. No sooner does one conflict come to an end then another erupts to take its place. We no longer live in a world where people living in one region are indifferent to the goings-on in other parts. Modern telecommunications technologies have rendered distances irrelevant. The most amazing development has been the internet which is poised to overtake Radio and Television as the most preferred medium of information dissemination. However, in Third World countries the traditional forms of media continue to be the predominant source of information for the public. Nevertheless, the roles that these media play in this part of the world continue to be the same-to inform and enlighten the public on what is happening around them and in other, more distant, regions of the world. It is in situations of armed conflict that the expertise of journalists is stretched to its limits. This is because of the political and economic fault-lines that criss-cross such armed struggles and on which the journalist must tread with infinite care and prudence.

Public expects the media to be impartial and unbiased in its reporting. If the media institutions are to win the Public's trust and command a loyal audience then they must ensure that their output is not slanted in favour of any one party. It is this respect that cut-throat competition takes place between media organizations, some media organizations such as the BBC are considered to be more impartial than others especially the state-owned ones. For the individual journalist working for the print media the pressure of impartially and disinterestedness are much greater and very difficult to manage. Every newspapers takes its own stance in political and economic questions. In a violent and dangerous region like Kashmir, it is, of course, infinitely perilous for newspapers to adopt extreme views for fear of retaliation. In such a situation, newspapers and their journalists must do their best to maintain their cool and try not to give way to prejudice. They must always bear in mind that they have a professional duty to report accurately and impartially without giving undue favour to any particular cause, Journalists must stand up to protect their independence from competing interest especially from the state. They must beware of attempts to lure them into a situation where they are employed as organs of propaganda by those determined to use the media as a vehicle for advancing causes at the expense of the public good.

We will now narrow the focus of our discussion and place it on the roles that the media is called upon to play in strife-torn areas, the media's most important role in a conflict situation is to keep the public reasonably well-informed of the hostilities. It must also keep the public posted on events that have a bearing on the common man's daily life.

The media present all opinions and viewpoints and by a balancing act put before the public a fair picture of the political scenario letting the public make up its own mind. It must not try unduly to influence the public by any sharp practice or by letting itself be used as a propaganda tool nor must it fall prey to the attractions of money or political patronage. All this is easier said than done, it is often the case that in state-owned media organizations, the journalist is constantly constrained by official policy requirements and has to side with the government. In many conflict-riddled places there are usually no independent electronic media organizations operating at a local level. There is usually a government – broadcasting service and several international broadcasters beaming their programmes into the territory, in such a situation, the local journalist who is employed by the state sector has little choice but to follow the official line. It usually falls upon the shoulders of the print media to maintain independence and impartiality, even they are, unfortunately, not able to do this. They often find themselves embroiled in intrigues and complex schemes at play in the conflict, sometimes they side with one party or the other and end up incurring the wrath of those whom they have shunned or presented in a bad light. In dictatorship like north Korea or Zimbabwe, it is next to impossible for newspapers and magazines to report impartially at least when the story relates to the activities of the government, many newspapers in Zimbabwe have been attacked and shut down because they have criticized the heavy-handed measures of the government there, as I have said above, the compulsions that force an organization to give up its impartiality are the greatest in relation to media entities operating at a local level, for international players like the BBC or the Voice of America the pressures are Minimal, although, these organizations are funded by their respective governments they are able to maintain quite a large measure of impartiality and accuracy in their reporting, they are especially trusted by people in Kashmir and in other areas of the world where conflicts and battles rage, however, we should not think that these organizations are entirely safe from any pressure, being protected in their fortresses in London and Washington DC, if we go back some years, we will remember the tragic death of Mushtaq Ali who worked with the then BBC correspondent Yusuf Jameel in Srinagar. In Such a situation, these organizations are called upon to balance the interest of fair and accurate reporting with the interest of not unduly risking the lives of their field staff.

The foregoing discussion about the impartiality of Western state-owned broadcasters like the BBC should not leave the impression that they are always impartial and unbiased, one need only look at the recent war in Iraq and how it was reported by the BBC to see that sometimes even these organizations find that they have to shed their impartiality and take a pro-government stance, during the war in Iraq, the British government vociferously rapped the BBC for presenting the British and the Americans in a bad light, the BBC was accused of hampering efforts to win the war by feeding the public images that the government wanted concealed, matters came to a head when a BBC presenter Andrew Gilligan boldly claimed that the British Government had lied to the public about Iraq's weapons of mass destruction, he claimed he had got this information from a government scientist (David Kelley). The scientist's name was soon released by the Government, much to his embarrassment and shame, he was so overcome with such feelings that he committed suicide, the Hutton inquiry that was held into this event led to the exoneration of Government from all charges of wrongs and the heaping of all the blame on the BBC, the attacks on its impartiality and credibility, the organization has suffered a huge setback its boldness a fearlessness in reporting the true events , however unpalatable they may be to the Government are now in danger of being replaced by scrutiny and submission the BBC and other western media entities are already under threat in the middle east most people in the middle east have begun to lose confidence in the ability of the western media to report truthfully, they are inc4reasingly perceiving the west as a foe therefore , they have begun tuning in to other media channels that offer a pro-Arab or pro-Islam outlook on world events foremost amongst these alternative channels is al Jazeera which is all about destined to emerge as the BBC of the Arab world. Al Jazeera presents an entirely new phenomenon in world broadcasting. It is satellite based and privately owned as such , there are no state pressure on it to confirm to any particular view point it has begun feeding the Arab world images of wars and conflicts as they happen al Jazeera is now increasingly becoming an essential item in every Arab home. It has provided coverage of the conflicts in Palestine and Iraq however in Iraq it has constantly come under attack from the American forces to its pro-Arab and anti American slant. Many Al-Jazeera reporters have been killed in attacks suspected to have been deliberately carried out by American troops it has been orders to wind up and leave Iraq because the Americans blame it for inciting the resistance against them. To conclude , we have seen how the media's roles in the conflict –p[prone areas are constantly changing and how they are shaped by the political and other forces brought in to the effect by armed conflict we should no longer assume that the western broadcasting organizations are the sole paragons of impartiality and fairness in reporting.

We must not be complacent about our own standards. There is still vast scope for improvement back home. We already have a flourishing print media that is by an large able to report without let or hindrance. However the government has to open up the electronic sector to private ownership so that impartiality can be bolstered the internet is already providing a platform for free spirits like tehelka.com however in a country where most people do not even have access to clean water it is the electronic media radio and television which counts it is in this sector that there is the greatest need for impartiality it is this sector which plays the most substantial role in modern public life. Finally it is this sector which must be freed from the clutches of undue influence so that it can robustly discharge its fundamental duty to the public.

To elaborate this point, again at home my word with you shall remain incomplete without making a special reference to the vital role of radio Kashmir Srinagar. Since its commissioning in 1948, this premier broadcasting centre has been performing many roles at the local levels. SHAHERBEEN, the daily current affairs Programme proved a turning point and mile stone in the history of broadcasting journalism of all India radio Kashmir , Srinagar in particular though the this new experiment/ traveled from BBC but developed as its originality, local scope and flavour just within a couple of months.

Most of the international and national and national Radio and Television broadcasters have been reporting about the conflict situation of the valley from their transmitting centers located either aboard or away from the valley. But credit alone goes to SHAHERBEEN as it exists in the valley, is being broadcast in the valley with the co-operation of a brilliant team of correspondents and reporters spread provided and opportunity to the local journalists for the first time to get closely associated with the electronic media and get their critical and analytical view point heard instantly by the local audience.

About a decade's local audience survey reveals that SHAHERBEEN despite contributing in extremely conflict situation, enjoys trust and confidence of the people because it represents them in true sense and also in a balanced way and with impartiality, This is because of the tremendous popularity of the programme and its revenue generating potential that the Prasar Bharti Authorities very recently issued directions to the all India radio Stations across the country advising them that they should take a cue from SHAHERBEEN and broadcast a current affairs programme in the same pattern and with the same title being associated with the programme we have stood a number of tests and have faced so many on slights, but we are committed to the conviction that we are at the service of public.

Status of Livestock Husbandry and its Scope in Nutritional Security and Socio-Economic Development of the State of J & K

By : Dr Nazir A Ganai and Dr M A Kirmani

The state of Jammu and Kashmir lies to the North-West of the country, stretching between $32^0 - 17'$ and $36^0 - 58'$ North latitude, and 73^0-35' and 80^0-36' East longitude. The state is covered with lofty mountains receiving heavy rain and snowfall during winter resulting in dense forest particularly in outer and inner Himalayan region. However, due to scanty precipitation on the huge mountains of Ladakh and Kargil, there is meager vegetation, and almost no forest cover. The state is divided into 3 distinct macro-climatic zones: **sub-tropical** Jammu region, **temperate** Kashmir valley and **Cold arid** Ladakh region. The state has 4 main physical divisions: (i) Outer Himalayan and Shivaliks in Jammu region, (ii) Middle Himalayas of Chenab Valley and Pir Panchal ranges in Kashmir region (iii) Inner Himalayas surrounding the Kashmir valley (iv) Greater Himalayas of Ladakh region. Over 50% of the total geographic area (101387 sq km) comprises the cold arid Ladak region, interwoven with nude and rugged mountains.

Because of the **peculiar physiography**, only 7.36% [(693,000 hectares), (Table 1)] of the total geographical area of the sate is under food crop agriculture. **Self-sufficiency in food grains** in hill and mountain states like J & K is a far off dream because agriculture is **mostly rain-fed**, which too is confronted with frequent crop failures due to the **fragile eco system** that is likely to worsen further from the uncertainties of the changing agro-climatic conditions. Coupled with it, the available land resource (7.36% of the total geographical area or 31% of the total area under land use) under all types of agriculture activity is shrinking from fast expanding population / urbanization / industrialization, putting an additional pressure on the livestock sector for the nutritional security and rural upliftment in hill and mountain states. The overall contribution of agriculture to GDP has dipped to a low of 0.9% in the year 2005, which reflects the fatigue after the spurt in food production during the green revolution.

Livestock husbandry is an important sector of our economy and a major component of the National Food Security system. It provides food, clothing and employment to man; draught power for agriculture and rural transport, especially in the otherwise in-accessible hilly terrains, and provides vast quantities of organic manure. It is not only the primary source of livelihood to about 20% of our population (nomadic tribes viz Gujars and Bakerwals, Changras, landless/marginal farmers) but also provides insurance cover to the agriculture farmers against the failure of crops. During the last 15 years, this sector has recorded a steady increase of 250% in its contribution towards National GDP as compared to 62% by agriculture during the same period. Added to it livestock sector contributes **25 per cent of agricultural out put** (40% if draught power and dung is also accounted for) and **6 per cent of total GDP** (Birthal et al 2002).

The state of J & K has registered a spectacular growth in dairy sector-about 8 fold increase over 30 years from 160,000 tones in 1970 to 13186000 tones in 2002, with per capita availability growth from 95 ml/day to **360 ml**/day (Table 2), which is higher than the national average (220 ml), and above the minimum requirements prescribed by MCI (280ml). The J & K state is only at 3rd rank in the per capita availability of milk. The crossbred animals with better productivity constitute about 40% of the total cattle population of 30 lacs in the state. These significant improvements in the production and productivity comprise just the 15% of the real potential of the dairy cattle, who still produce a low of 1000 lts per lactation against 8000 lts in the developed word. This **untapped livestock potential** (85%) holds both **hope and scope** for nutritional security and socio-economic development of the farming community. *The realization of the growth in dairy sector is all the more important in this hill and mountain state wherein the agriculture is confronted with insurmountable problems. To achieve a target 400 to 600% growth in milk production from 13 lac tons in 2003 to 73 lac tons in 2030, the challenge is to raise the per animal milk productivity from 1000 lts to 3000 -5000 lt lactation yield,* ***without expanding the cattle population*** for reasons of **decreased carrying capacity of the land, the shrinking resources, and tough competition**

with the man and other livestock species. The major constraints in the dairy development in the state are dearth of the superior quality bovine germ plasm, low productivity, shrinking resources, feed / fodder scarcity, lack of proper infrastructure, low conception rate and knowledge communication gap.

Not only have we to increase the milk production further, but also to concentrate our efforts on improving the quality of milk and milk products, which has assumed enormous significance after the liberalization policy and the rapid transformations that are taking place consequent to the GATT agreement and establishment of the WTO. Newer and stricter sanitary standards are being framed for regulating quality standards. Under these circumstances, our practices for production and processing of milk cannot stay at variance with national and international standards.

Because of the predominant non-vegetarian food habits, the state is acutely short in animal protein requirements, with a total availability of 344 lac kgs of meat (mutton, chevon, poultry) against a huge requirement of 1100 lac kgs as per the minimum requirements of MCI (Table 2). The main limiting factors for this scenario are the poor genetic potential of the animals and shortage of quality feed / fodder resources (20 % in fodder on dry matter basis, and almost 70% in concentrate feeds). The situation demands a holistic approach of conserving the very diverse gene pool of the sheep and goat on one hand , and simultaneously evolving fast growing, disease tolerant mutton breeds adaptable for specific agro-climatic conditions of ladakh, Kashmir and Jammu. To realize the 600% growth in meat products by 2030, diversification to buffalo meat, rabbit meat with concomitant induction of the State-of-art slaughter facilities is very essential. Meat processing industry has to grow for production of clean, nutritious, tasty and noval meat products.

TABLE 1: GRASS LAND DISTRIBUTION IN J & K

Land Type	Area (000 hac)	% of total land	
		Out of total geographical area	Out of area under land use
Total geographical area	10138.7		
Total Area under Land Use	2416	23.8%	
Forest + Alpine Pastures	656 (356 +300)		

Grazing land	125	10.5%	44%
Land under miscellaneous trees	72		
Cultivable waste land	142		
Fallow land	12		
Cultivable fodder land	54		
Net area sown for crops	747	7.36%	31%

TABLE: 2 AVAILABILITY OF ANIMAL PRODUCTS IN 2001 AND REQUIREMENTS IN 2030 AD

Product	Present Status (2001 AD) (Human population = 10 million)				Requirement in 2030 AD (Population = 20 million, at a growth of 2.9% / annum)	
	Production (Per capita availability p.c.a.)	Requirement (Per capita requirement)	Deficiency	Loss to state Exchequer	Requirements in 2030	% Increase demand
Milk	13 lac T (360 ml)	(280 ml)	——	——	26 lac T (@360 ml p.c.a. 52 lac T (@700 ml p.c.a.	200% 400%
Meat (Mutton, Chevon, poultry)	344 lac kg (11g/person/day)	1100 lac kg (34g/person/day)	750 lac kg	Rs 5250 million	2200 lac kg	600%
Egg	600 million (60 eggs/person/ /year	3600 million 365 eggs/person /year	3000 million	Rs 6000 million	7200 million	1200%
Wool	67.1 lac kg					

About 90% of the livestock population subsists on natural grasses that are available in grasslands, meadows, forests, waste, barren and fallow lands. The high grazing pressure, and lack of adoption of any scientific management practices is resulting in their degradation which is affecting adversely the herbage production and in turn the poor livestock production (Singh 1995). The state has 10.5% (1061 thousand hac) of the total geographical area or 42% of the area of land (Table 1) under grasslands, meadows, forests, waste, barren

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and fallow. Despite this huge resource, there is shortage of fodder because of the lack of the organized and sustained scientific management of such grasslands. For **sustainable livestock development**, the **challenge** is to **decrease the cost per unit of production.** Since most producers' have no control on the price of livestock and livestock products, lowering the cost of per unit production is a way to increase the profit. The cost per unit of production can be reduced with less dependence on purchased feed / fodder, improvement in animal health through better prophylaxis, and by minimizing external inputs. Therefore for **nutritional security and rural upliftment,** a multi-pronged strategy for sustainable development of livestock husbandry in a hill and mountain state like J & K (with limited scope of expansion of agriculture) need to be adopted through management and conservation of natural pasture lands for **increasing the carrying capacity**, and for **surplus fodder production** needed during the lean winter season. Added to it, the technology need to be refined and transferred to the farming community **for enrichment of the huge available quantities of poor quality crop** residues for maximum utilization, and to reduce the competition for grains with man and other livestock species. Such sustainable development should be environmentally non-degrading; technically appropriate; economically viable and socially acceptable.

ANIMAL HUSBANDRY IN THE NEW MILLENIUM:

The new millennium poses **more challenges than promises** to both the veterinary and animal husbandry sectors. The most important being the challenge of 2025 when Indian is poised to be the most populous country of the world .The challenges facing in hill and mountain states like J & K are even more tough in light of the facts that : (i) small fraction of the total land (7%) under all types of agrarian activity is going to shrink further from fast expanding population/industrializations. This is going to put additional/more pressure on the livestock sector for the nutritional security of 160 lacs human population (ii) The already fragile eco-system of the hill and mountain states is likely to worsen further from the global warming /green house effects thus putting the existing agricultural activities at more risk of failure than before from the ever increasing uncertainties of the agro climatic conditions (iii) Crop agriculture seems to have developed the signs of fatigue. Targeted growth rate (6%) of 11th five year plan in agriculture can be achieved by emphasis on livestock sector.

CHALLENGES:

Vertical growth in animal productivity

- The achievements made so far in the state are despite the unplanned, un-organized and haphazard efforts, rather were destined to come with that initial kick start of crossbreeding of the local with exotic germplasm. *The horizons are therefore very wide open for further spurt of growth with new organized and skilful interventions.* **The challenges lying ahead, after the initial growth, pose an uphill task of meeting the future requirements of the fast growing human population from the static or even the smaller animal population due to decreased carrying capacity of the land and the shrinking resources from competition with the man and other livestock species.**

  This challenge can only be addressed by improving the per animal productivity. The inherent factors of the low productivity of our livestock are:

- Poor genetic potential of our livestock due to non-availability of superior germplasm adapted to the local conditions. The state of J & K has currently an acute shortage of high potential breeding bulls, the principal cause for the failure of expanding the dimensions of the crossbreeding programme for bringing the entire population of 17.3 lac breedable cows under its gambit. In order to give an AI cover to at least 60 % of the breedable cows with an average of one bull /6,000 breedable cows, the minimum number of breeding bulls required are given as under:

NO OF BREEDABLE BULLS REQUIRED IN THE AI PROGRAMME OF THE STATE

Division	Crossbred cattle			Local cattle		
	Total	Breedable cows s required	No of bull	Total	Breedable cows	No of proven bulls required
Kashmir	9.14 lac	5.56 lac	65*	6.0 lac	3.19 lac	30*
Jammu	5.0 lac	2.59	30*	11.0 lac	5.47	50*
Ladakh	.213 lac	.115	7**	.715 lac	.398	23**
Over all	14.35	8.27	102	17.72	9.07	103

Notes

* *Kashmir and Jammu divisions : An A I cover of 60 % breedable cows, with one bull every 10,000 breedable cows*

** *Ladakh divisuion : An A I cover of 60% breedable cows, with one bull every 1000 breedable cows because of difficult access to different areas due to the hilly and undulating terrain.*

The situation regarding the availability of the superior germplasm in sheep, goat, buffalo is even more worse, thereby increasing the lag period of the genetic improvement in farmers flocks. To meet such requirements, the solution lies in establishing the nucleus herds /flocks of elite animals with a stringent and scientific breeding policy followed for continuous genetic improvement to reach the targeted goals.

- **Shortage of feed / fodder coupled with their poor nutritive value.**

  Due to increasing pressure of human population on our land, there is hardly any scope for increasing the area under pasture and cultivated fodders. To reduce the gap between availability and demand of feed / fodders, there is a need to make greater use of agro-industrial byproducts as animal feed, and exploitation of non-conventional feed resources (apple pomace, marine algae.......), and improvement of the feed value of crop residues. Manipulation of rumen micro flora for enhancing fiber degradation and through dietary modifications is a very potential area of research to be undertaken that can ultimately lead to faster growth of the young stock, and improved productivity of adults. Policy intervention and R&D efforts need to be directed for improved per animal productivity at reduced cost of operation for ensuring greater nutritional security.

- **Quality Control of animal products / byproducts**

  The international trade scenario is fast changing consequent to the GATT Agreement and establishment of the WTO, which are going to convert the whole world into a single market. The success of any product in the international market lies in its quality, standards of purity, value addition, sensory quality attributes, shelf life, asepsis, minimal residual effects of pesticides/antibiotics to organic nature of foods. The concomitant increase in production will have therefore to be viewed in light of these factors for a successful entrepreneurship. Hence biotechnology, packaging &preservation and food science offer new opportunities which we must capitalize through R & D efforts both in public and private sectors.

- **Commercialization of Food processing**

  The success of livestock husbandry lies in its commercialization from the producer to the processor. For better returns to the farmers for their produces, and market development, the processing of the animal products /byproducts has to be given the shape of the industry to handle the raw material to the finished products instead of selling at cheap prices to outside industry. However, for encouraging the entrepreneurs in establishing the units for processing of milk, meat, wool, hides/skins, bones a sound support system in terms of human resources and continuous scientific inputs has to be made available all time.

Future Research Programs:

To meet the future requirements of fast growing human population without increasing the livestock in numbers by improving the per animal productivity, specific target oriented research programs will have to be put in place with sufficient infrastructural facilities in the areas of:

a) Breeding & Management to produce proven high potential germplasm to raise the productivity for vertical growth in livestock sector. The new approach should focus the Molecular Breeding of livestock using techniques like Marker / Gene Assisted Selection , Marker Assisted Gene Introgression

b) Physiological manipulation of rumen microflora for augmentation of reproduction, growth, lactation

c) Manipulation of diets and exploitation of non-conventional feed resources

d) Biotechnological applications in animal improvement.

e) Embryo Transfer Technology, including sexing and cloning need to be attempted to accelerate the growth rate. Bio tools need to be extended for production of transgenic animals with specific genes which can boost up production, modify product desirability, or the animals could serve as bio-reactors for bio-pharmaceutical production.

f) e-Husbandry for integration of the key stake-holders in livestock Viz R & D institutes i.e. Agricultural Universities, Animal/Sheep Husbandry Deptts, Livestock Development Boards), Milk Federation, farmers, consumers for Convergence and Synergy, Knowledge Connectivity, Capacity Building, and e-governance.

IMPACT

➤ Rural Upliftment

Prosperity of a nation has its roots in the upliftment of the 75% of its people living in rural areas, especially in a state like J & K whose 25% population has its direct dependence an livestock sector for its livelihood. The challenge of the new millennium would not only be to sustain their livelihood, but to improve this economy for better living /health conditions. There are regions/pockets like Leh, Kargil , Gurez, Karnah, Doda, Rajouri, Poonch, Kandi Area Of Kashmir Valley, where the agriculture activities are virtually negligible and hence demand a special attention for development of the livestock husbandry in such regions.

Nutritional Security:

By 2030 AD, India is going to be the most populous country in world - a matter of utmost concern to the planners, economists and scientists, and the state of J & K with no less exception. Our state will have to accommodate and feed a whoopng population of the size of 20 million(Over 7 times what we were in 1950's) against shrinking space and resources and the uncertain and changing agro climatic conditions ,posing stringent conditions/challenges to crop husbandry. Cereals alone do not make complete food unless adequately fortified with animal protein rich in essential amino acids. What a state really needs is balanced food to build a strong and healthy nation. Economic growth is slow and painful process demanding total scientific exploitation of all the natural resources in a very wise and sustainable way uninhabited by sentiments, prejudices and other extraneous considerations in a time bound manner. Despite the significant strides made in almost all agriculture sectors during post independence era, self sufficiency in still a dream com true in all sectors except dairying where a 16 fold increase in the production from 0.81 lac metric tones in 1951 to 13.0 metric tones in 2003 has put the per capita availability of 330 ml well above the minimum level of 270 ml prescribed by ICMR (Table 2). However, we can not be complacent with just these minimum levels .In all other sectors threre are wide deficiency gaps which account for huge losses to the state exchequer. If only deficiency gaps in protein (meat) requirement (700 lac kg) are accounted for, the losses are to the tune of Rs 560 crores annually. In a state like ours where the food habits are predominantly non-vegetarian, such huge deficit gaps in protein (meat) and energy (food grains) cannot be compromised as otherwise the strict trade and tariff rules and political changes / compulsions may shatter and collapse the economy of the state beyond repair. Therefore for a secure and more prosperous future, we have to adopt a multi-pronged strategy for *sustainable development which encompasses the management and conservation of the natural resource bases, and orientation of the technological and institutional change in such a manner as to ensure attainment and continued satisfaction of human needs for the present and future generations.* Such sustainable development conserves land, water, plant and animal genetic resources; is environmentally non-degrading; technically appropriate; economically viable and socially acceptable.

- **Employment generation:**

The rising discontent / unrest among the unemployed educated youth cannot be tackled by only providing the government jobs, which are becoming uncommon with every passing day. To face the future challenges, the state has, therefore, to gear up well in time to identify and develop the potential employment generation areas. Livestock husbandry is one of such potential areas which if adopted on entrepreneurship basis has the advantages of diversity of commercialization, low capital investment and quick returns . For adoption of such self-employed entrepreneurship schemes, the educated unemployed youth need to be given vocational trainings with continuous technical support and financial assistance by the government.

Conclusion:

Targeting a growth rate of 6 - 7% and the requirements of 20 million human population, the state would be require about 60 lac tones of milk, 2200 lac kg of meat, 7200 million eggs by 2030. With the future targets as challenges, unless a structured organizational base is planned now to make it an essential part of the developmental process for increased production and productivity from animals, the transition from in-sufficiency through self-sufficiency to surplus to feed the upcoming industry, will not be a reality. Therefore, it is imperative for the policy planners now to lay strong institutional base.

SIGNIFICANCE OF E-COMMERCE

By : Riaz A. Patloo

The cyber world has been gifted with virtually everything chat rooms, business, special symbols for chat, voice mails, internet telephony, video conferencing and so on. We have almost parallel economy running in cyber space in terms of e-commerce, e-cash, e-banks, e-entertainment, e-hospital, cyber-police, e-government, in short we recognized the cyber-world as a system that exists in parallel with the real world, today the internet has information on almost everything from A to Z from business to jobs, medicine to engineering and from art to fiction, the real world and the cyber world are now like two parallel tracks, no one can ignore one and except to gain from the other.

As every body knows information technology is changing the way the world handles business, goods and services can be developed bought sold and even delivered over electronic networks, today it is possible for a customer to access information select products, order them and make payments online.

Communications information product delivery and payment mechanism are the basic ingredients of e-commerce, now many governments in the world has got website which purpots to give citizens various facilities, on can apply or a ration card on it, one can apply for driving license etc., the web is slowly but surely changing the way we live, we can today use the net to check our bank accounts status, check telephone and electricity bills and even pay them online order books home essentials CD's or a pizza book movie tickets check railway reservation and airfares and much more just at the clock of a button. The internet also has become a standard of communication with friends and relatives across the globe may it be through emails, voicemails or internet telephony, there is no doubt about it that the dot.com craze has taken the world by storm, the business opportunities are immense now time has come that we should take J&K state to new heights. To do the marketing of our products through internet is to make a website first, for making a website means that we are going to open an office at international level, that will remain open for 24 hours even when are sleeping, if any person wants to buy our products he can purchase it anytime, even if we are sleeping or doing other work. One can do the marketing of his products like he can put his banner in other website which has large traffic on his site. So that people can click it and reaches his site one can also do the marketing of there products through e-mail. By doing the marketing one can focus on customers globally doing the marketing though internet one can also save money, people are purchasing products without human interaction. In the fifties if you to went to US and asked them what they were proud about they would tell you that their automobile industry make their country in the seventies if you went to Japan they would probably say that about consumers electronics we can justifiably say that about information technology now it is almost as if European countries has found its brand identity source of revenue which is primarily popular with a website is the affiliate programme is employed to promote a site through another site.

Some dot.com initiatives have been relying heavily on advertising as their source of revenues, another source of revenue is the data base that the venture is able to develop. Some site require users to register with them for using their free bies, others lure users by various benefits, lotteries schemes etc.

By doing the marketing through internet one can focus on customers globally, doing the marketing though internet one can also save money, people are purchasing products without human interaction. A large data base is developed which can be sold to direct marketing organization for a fee. The impact of the knowledge economy on business is most profound and very visible. In order to survive in todays competitive market business need to recognize and manage the knowledge within the organization as an asset. Did you ever think you could earn even when you dream. Literally the net has made even this possible today.

Access to information is a basic right stimulate the world's economy to the benefit of all. The business community has now come to understand information as a valuable commodity required for planning directing controlling decision making motivating forecasting and so on. To ensure productive a gainful operation there is therefore need for creating. Low cast higher quality higher functionality and high integration products that satisfy man basic desires for a better life. The key to developing these products and services is understanding how to use information effectively in order solve business problems creating library and information center is an important aspect to achieving timely identification of the business groups. Information technology boosts a nation's economy information technology offers major new business and management opportunities. It has the potential to be a strategic weapon in different ways. It helps to gain competitive advantage. It improves productivity and performances, it enables new ways of managing and organizing it also helps to develop new business.

Ignoring need of information technology policy makers have stumbled from blunder to blunder, for it is not they who pay the price, they are even often rewarded for their mistake, but common people have to pay heavy price for it. Information technology will have a major impact on the way we do our business now technology is becoming an integral part of our business. The internet gives us access to the world as a market, offers us new consumers, more opportunities and quicker return.

No business deal will have to wait for tomorrow and there will be no well defined office hours. It will be 24 hours business, whether day or night the cyber world will never let you down it will not sleep and neither will your business, because the internet world is the most advanced information network that we have today.

EXPANSION OF HAZRATBAL SHRINE ON CARDS

By : Javaid Malik

The Jammu and Kashmir government's endeavor to beautify the Hazratbal shrine on the banks of world famous Dal lake, housing the holy relic of Prophet Muhammad (SAW) on the pattern of Taj Mahal is an ambitious project taken up by the state government in year 2006.

Officials believe that within two years shrine would present a complete new look. Projected beautification would make it one of the magnificent and grand site with expanded lawns right from the banks of Dal Lake to Naseem Bagh on one side and up to Kashmir University and Engineering College and nearly five lakh people could offer prayers at a time conveniently.

The foundation of the shrine was laid in early seventeenth century when the Sadiq Khan, the Subedar of the Mughal Emperor Shahjahan laid out a garden here & constructed a palatial building, Ishrat Mahal in 1623.

However, the Emperor, during his visit in 1634, ordered the building to be converted into a Mosque with some additions & alterations.

During the time of Aurangzeb, when Holy Relic arrived in Kashmir in 1699, it was first kept in the shrine of Naqashbad Sahib in the old city.

Since the place was found to be insufficient in view of the unprecedented rush of people who thronged to have a glimpse of the Moi-e-Muqqades, it was decided to shift the holy relic to Hazratbal, then known as Sadiqabad. The Holy Relic is displayed on Various occasions related with the life of Prophet (SAW).

Shrine is spread over 292 kanals and nearly 2000 Namazis get

Javaid Malik is presently working as Journalist in Greater Kashmir accommodated in one Safa and shrine accommodates more than 150 safas. However during Urs days and on auspicious days number of devotees who want to offer prayers crosses more than 5 lakh against the present capacity of three lakhs. " In order to accommodate all the devotees we are acquiring more land and we are holding negotiations with the inhabitants," said Chief Executive of Wakf board Altaf Hussain.

On the instructions of the Chief Minister Ghulam Nabi Azad, authorities have decided to carry out the expansion and the beautification of the shrine in the phased manner. In the first phase Southern side of the shrine would be developed and nearly 17 houses and 12 shops would be demolished. In the second phase, beautification and expansion of Northern side of the Shrine would be taken up. Officials say that idea is to make Shrine visible from all the sides on the pattern of Taj Mahal. Development of 62 kanals from the Gulab Bagh side has already started and is expected to be over soon.

Officials say that those people whose structures would be demolished would be given adequate compensation and before the commencement of the demolition drive inhabitants would be taken into confidence. WAKF board has got 15 kanals of allot-able land in its possession and officials claim that it would be enough to accommodate those people who would get dislocated. WAKF board is coming up with a shopping complex in the main market to accommodate the shopkeepers whose shops would be lifted.

UNEMPLOYMENT: EVER INCREASING PROBLEM IN JAMMU AND KASHMIR

By: Aurangzeb Naqashbandi

The unemployment problem in Jammu and Kashmir has assumed alarming proportion with thousands added to the ever increasing number every year. Many believe it is the root cause of the present turmoil in the state. The major challenge facing the Jammu and Kashmir government is also unemployment as there are around three lakh educated youth without jobs in the state. Thousands of youth queue outside the state's 17 employment exchanges hoping for a job. Several factors have contributed to this problem and one of them being the increasing concentration of population in urban areas. According to a study, the number of workers in the state has registered an increase of 39 per cent during 1981 and 2001. The total number of workers in Jammu and Kashmir now stands at 36.89 lakh including 11.52 lakh marginal workers. About 43.36 percent of the total workforce were Cultivators, 6.74 per cent were agricultural labourers and the remaining 49.9 per cent were engaged in other activities including household Industries. Female workers contributed about 28.4 per cent to the total work force and the share of female marginal workers was 66.84 per cent of total female workers. Considering the increase in population of the state from 59.87 lakh in 1981 to 100.70 lakh in 2001, employment generation and job opportunities have not kept pace with the population growth. Also the minimal industrial development is unable to absorb the large pool of school leavers and there is a virtual freeze on state government recruitment as jobs have reached saturation point. The Jammu and Kashmir government is pursuing with the Centre for announcing an employment package for the educated youth of the state which would help in tackling the problem to

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Aurangzeb Naqashbandi is presently working as Journalist in UNI a large extent. The problem of unemployment gains more importance because of increasing educated unemployment, absence of industrial growth and continuation of agriculture and allied sectors as subsistence sector for 70 per cent of the population is directly or indirectly dependent on it. The broad areas of action to be followed to generate employment opportunities are as; As a major source of income and employment for the locals, revival of tourism needs to be ensured to increase direct and indirect employment, development of other sectors such as horticulture, agro-based industries, handloom and handicrafts, sericulture can generate employment opportunities in the state. Setting up of hydel power projects can also provide employment opportunities to technical and non-technical people. Biotechnology and Information Technology, the new emerging knowledge-based industries, which have high employment potential, need to be focused upon. The IT industry, though not well developed in the state, has tremendous potential for growth. For developing IT, the knowledge-based industry, a large pool of educated and skilled youth in the state provides the required manpower. The geo-climatic condition offers an ideal location for setting up the IT industry. The development of this industry would help the state economy to solve the problem of unemployment. The announcement of a comprehensive package of Rs 6,165 crore by the then Prime Minister Atal Bihari Vajpayee at the end of his three-day visit to Jammu and Kashmir on May 2002, covered various aspects but the main thrust was on generation of new employment opportunities for the youth of the state. The present coalition government in its recent budget proposals had suggested several measures aimed at employment generation. These include setting up of an Employment Mission.

How far these measures would be implemented to check this ever-increasing problem one can only wait and watch.

ANTI-CORRUPTION CRUSADE

By:-D.A.Rashid.

J and K state's political boil aside, the corruption in the state has broiled everything and the efforts of the government to extirpate it has come a crooper only. Having the dubious distinction to be the second most corrupt state of the country, a pretty legion believe that J & K is second to none in the tag of corruption. If we believe in unvarnished truth then the ghost of corruption has gobbled the state and tarnished its image beyond a measure.

More than the blurred image, soaring corruption has unleashed a devastating loss on the state and deprived it of prosperity to the hilt.

In the wake of Gh. Nabi Azad coming to highest echelon of power of the state, an overt anti-corruption crusade was pronounced and the chief Minister has had attached a titanic gravity to the war against corruption. "Anti-corruption Crusade" is a concomitant part of his public speeches and in his vent at the functions organised by the government. At times his whole speech boils down to the gist of corruption evaporation. But the verbose speeches are believed to be at discordant line with the ground reality.

A few in the government administration with an untarnished image and uncompromising integrity evaluate Azad's corruption war nothing more than a mole elevated to mountain. They brand the Corruption war a tinsel under which the rotten system lay bare and the Chief Minister would be entangled if he touches the cloak beneath which tainted sketches and verbose story of has wealthy ministers and bureaucrats lie. Would the Chief Minister render his war against corruption an effective crusade by floating an edict that the assets of his ministers and bureaucrats be evaluated and come out with a ratio of their properties to their legal known sources of income.

" For a cosmic change, cosmetic measures have no place. Reining in a 4th

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D. A. Rashid is presently working as Journalist in Alsafa.

class government employee is easy but making a bigwig vomit his ill-gotten assets is difficult. Has anyone audacity to evaluate the assets of Sharks and look into it where from these assets came" questions a top bureaucrat of State with almost no taints.

A bile against the corruption must be vindicated and it should not be taken as vindictive to raise finger at the strong tainted people wielding power enough to escape a trap. Mr. Azada's anti-corruption war can not engender a change and make a clean sweep of corruption until people occupying higher echelons of power are put to accountability and imbibe a sense that law is as same for them as for anyone else.

By amending an Act, the government has empowered the State Vigilance Organisation by authorizing it to seize the assets of venal people. It would definitely add teeth to the Vigilance as the anti-corruption organisation was not potent enough to take any action on its own. If the present government is really sincere to uproot corruption, then the Chief Minister, Azad should ensure that the teeth of vigilance are as strong for big wigs as for others.

It is apodictic that some people in vigilance organisation are tough enough to compromise their integrity and do not choose to buckle down under a pressure. But it is the powerless vigilance organization of the state that impedes them. The need to strenghten the anti-corruption body should be a prime concern for the government to make the state really corruption free.

AGRICULTURAL DEVELOPMENT AND ITS SOCIO-ECONOMIC IMPACT

Prof. Syed Sajjad Hussain, SKAUST (K)

The State of Jammu and Kashmir lies to the North-West of the country, stretching between 32 -- 17' and 36 – 58' North Latitude and 73 – 35' and 80 – 36' East Longitude. The state is covered with lofty mountains receiving heavy rain and snowfall during winter resulting in dense forest particularly in outer and inner Himalayan region. However, due to scanty precipitation on the huge mountains of Ladakh and Kargil, there is meagre vegetation and almost no forest cover. The state is divided into three distinct climatic zones; sub-tropical, Jammu, temperate, Kashmir valley and cold arid Ladakh region. The state has main physical divisions (i) Outer Himalayan and Shivaliks in Jammu region, (ii) Middle Himalayas of Chenab Valley and Pir Panchal ranges in Kashmir region (iii) Inner Himalayas surrounding the Kashmir valley (iv) Greater Himalayas of Ladakh region. Over 50% of the total geographical area (101387 sq.km) comprises the cold arid Ladakh region, interwoven with nude and rugged mountains.

Agriculture

Agriculture is the largest solar energy harvesting enterprise. It has always been the mainstay of our economy. It employs more than two third of the labour force in the entire country and is a major contributor to the national economy. It meets our basic need for food and also the requirement, for most of the raw material needed by the manufacturing sector. Science and Technology have contributed significantly to agriculture in terms of improving productivity and quality. In order to gain a foothold in the highly competitive global market and to make major gains in the export market, there is an increasing demand for professionally qualified people in this sector. Agriculture Education has paid rich dividends in advanced countries benefiting not only the farmer but also the society as a whole.

In India, with 70% of the population being dependent on agriculture for its livelihood, agricultural education should receive prime importance from the school level itself. Research findings from World Bank point out that among the factors that accounted for economic growth, education contributed 11.1 per cent in Asia.

Agriculture is science-based high tech and offers a future of rapidly expanding opportunities, like animal and plant researchers, food scientists, nutritionists, bankers and market analyst, sales professionals, food processors, forest managers, wildlife specialists. The following factors seem to be fueling agricultural demands in near future:

Merging and consolidating business:

The changing business structure in food production and delivery systems is expected to have the greatest impact on agricultural jobs.

***Continuing globalization*:**

Growing grlobal trade is creating more and more jobs for the passouts from the agricultural institutions.

Changing consumer demands:

The desire for greater convenience in food preparation and more time for leisure activities will generate jobs.

Far reaching public policy decision:

Choices regarding food safety, environmental regulations, research and rural development and land use will dictate job opportunities.

With increased rural population mass illiteracy and induction of modernised and commercial outlook into agriculture, ruralization of higher agricultural education has become a necessity now more than before. Producing food and fibre in modern agricultural system has no equal among production industries in terms of variety and breadth.

The successful and result oriented interaction between public funded institutions and private sector in several areas of agriculture such as seed production, farm implements and machinery, disease diagnostics and vaccine, value addition and post harvest processing in cereals, pulses, oilseeds, fruits and vegetables, milk, meat ands fish product testing and evaluation can help in bringing together efficiency, flexibility on the private sector with the accountability and social interest of the public sector.

So the agro-industry can be an integrated and active partner in strengthening the agriculture. Food processing can be taken as one of the focus areas which is employment intensive and has ability to create 1.8 jobs directly and 6.4 indirectly across supply chain of every Rs.1.00 million invested.

Crop production practices, are devoted to producing carbohydrates and proteins in grains and legumes and these staple crops form most of the Carbohydrates and basic source of proteins for our daily breakfast cereals or meals at fast food establishments. The crop production is the most basic activity in agriculture, utilizing natural resources of soil, sunlight, air and water to produce Carbohydrates & proteins, the two key components in the food chain.

Agriculture production involves information on best-adapted crop varieties, methods of soil analysis for determining optimum fertilization and cultural practices such as best plant populations.

Methods of plant protection are shifting to biological and non-toxic methods. Examples are biological parasites and sex lure baits. Others include viruses, concern on the impact of commercial pesticides on the environment.

Fruit and vegetable consumers have become accustomed to insect and disease free fruits and vegetables and such quality is possible only through specialised form of plant protection methods. In urban areas, horticulture avenues in turf—grass production, lawn and ornamental care, and floriculture offer an expanding number of self-employment opportunities.

Horticulture includes growing flowers, trees, shrubs and other plants in gardens, orchards, forests, nurseries and greenhouses. A nursery is a place where plants are raised for sale, transplanting, testing and research. Nursery Workers help to conserve natural resources and make the environment beautiful. They plant, tend, fertilize and sometimes harvest flowers, shrubs and other plants. They work indoors in greenhouses and water gardens, as well as outdoors in parks, private and public gardens, flower farms and fruit orchards.

Horticulture workers in nurseries are involved in the growing and selling of flowers and plants. Recording the growth of plants is an important part of the job. They must also know how to grow, transplant, feed, protect, store, prune and handle plants for the best results. Other horticultural workers plant, prune, feed and provide pest control for trees. So the social as well as economic benefits arising out of it can be better harvested if taken up on entrepreneurship basis.

Livestock and dairying :

Prosperity of a nation has its roots in the upliftment of the 75% of its people living in rural areas, especially in a state like J&K whose 25% population has its direct dependence on livestock sector for its livelihood. The challenge of the new millennium would not only be to sustain their livelihood but to improve this economy for better living/health conditions. There are regions/pockets like Leh, Kargil, Gurez, Karnah, Doda, Rajouri, Poonch, Kandi area of Kashmir valley, which require special attention for development of the livestock husbandry.

Livestock husbandry is also an important component of our economy and a vital component of the National Food Security system. It provides food, clothing and employment to man, draught power for agriculture and rural transport, especially in the otherwise inaccessible hill terrains, provides vast quantities of organic manure. It is not only the primary source of livelihood to about 20% of our population (nomadic tribes viz Gujjars and Bakerwallas, landless, marginal farmers) but also provides insurance cover to the agriculture farmers against the failure of the crops. During the last 15 years, this sector has recorded a steady increase of 250% in its contribution towards National GDP as compared to 62% by agriculture during the same period. Added to it livestock sectors contributed 25% of agricultural out put (40% if draught power and dung is also accounted for) and 6% of total GDP (Birthel et al 2002).

The role of livestock in the overall agricultural development will continue to be important given the fact that India has the largest population, 16.2% of the cattle and 57% of the buffaloes in the world and globally also India is the highest producer of milk i.e about 92 million tonnes accounting for 15% of the world's milk production. It has second largest population of goats (16.7%) and is also among the leading nations in terms of poultry production (5.2%) and production (3.4%) in the world. The per capita consumption of milk has gone up from 124 g/person/day to an estimated 232 g/person/day from 1950-51 to 2004-05. Besides per capita annual consumption of eggs has gone up from 5 to 41 in the corresponding period. With this rising trend in the production and per capita consumption, the commercialisation trends in dairy sector are greater today, while poultry production has largely been transformed from backyard activity to a commercial activity. The growth rate of milk and eggs has been 4.08 and

7.09% during the Ninth Plan.

The state of J&K has registered a spectacular growth in dairy sector. About eight fold increase over 30 years from 160,000 tonnes in 1970 to 13186000 tones in 2002 with per capita availability growth from 95 ml/day to 360 ml/day, which is higher than the national average and above the minimum requirements prescribed by MCI (280 ml). The State is only at 3rd rank in the per capita availability of milk. The crossbred animals with better productivity constitute about 40% of the total cattle population of 30 lac in the state. These significant improvements in the production and productivity comprise just the 15% of the real potential of the dairy cattle, who still produce a low of 1000 lts per lactation against 8000 lts in the developed world. This untapped livestock potential (85%) holds both hope and scope for nutritional security and socio-economic development of the farming community. The realization of the growth in dairy sector is all the more important in this hill and mountain state wherein the agriculture is confronted with insurmountable problems. To achieve a target of 400 to 600% growth in milk production from 13 lac tones in 2003 to 73 lac tons in 2030, the challenge is to raise the per animal milk productivity from 1000 lts to 3000-5000 lt lactation yield without expanding the cattle population for reasons of decreased carrying capacity of land, shirking resources and tough competition with the man and over livestock species.

Dairying is highly science oriented. It involves lactating animals that produce one of the most whole some and widely used human foods.

Milk is a primary source of calcium to meet the recommended dietary allowance (RDA) of 1 gm. of calcium per person per day. Milk also is the principal source for humans of Vitamin D and with its sugar lactose and protein casein, it continues as a major part of our diet.

Dairy science, therefore, centres on assessing individual animal performance, including growth rates of a calf, daily milk production, analysis of milk and period of lactation. Those in practice seek to utilize tools of modern nutrition, genetics, physiology and parasite control to increase production per cow. The final goal is to realize the best possible profit margin in an industry under increased price/cost pressures. Intensive animal care in modern dairies presents special opportunities for job avenues in animal welfare.

Not only have we to increase the milk production further but also to concentrate out efforts on improving the quality of milk and milk products which has assumed enormous significance after the liberalization policy and rapid transformation that are taking place consequent to the GATT agreement and establishment of the WTO. Newer and stricter sanitary standards are being framed for regulating quality standards. Under these circumstances, our practices for production and processing of milk cannot stay at variance with national and international standards.

By 2030 India is going to be the most populous country in the world which is a matter of utmost concern to the planners, economists and scientists and the State of J&K with no less exception. Our State will have top accommodate and feed whooping population size of 20 million (over 7 times that we were in 1950s) against shrinking space and resources and uncertain changing agroclimatic conditions, posing stringent conditions/.challenges to crop husbandry. Cereals alone do not make complete food unless adequately fortified with animal protein rich in essential amino acids. What a state really needs is balanced food to build a strong and healthy nation. Economic growth is slow and painful process demanding total scientific exploitation of all the natural resources in a very wise and sustainable way uninhabited by sentiments, prejudices and other extraneous considerations in a time bound manner. Despite the significant strides made in almost all agri sectors post independence era self sufficiency is still a dream come true in all sectors except dairying where a 16 fold increase in the production from 0.81 lac metric tons in 1951 to 13.0 metric tones in 2003 has put the per capita availability of 330 ml well above the minimum level of 270 ml prescribed by ICMR. However, we cannot be complacent with just these minimum m levels. In all other sectors there are wide deficiency gaps, which account for huge losses to the state exchequer. If only deficiency gaps in protein (meat) requirement (700 lac kg) are accounted for, the losses are to the tine of Rs.560 crores annually. In a state like ours where the food habits are predominantly non-vegetarian, such huge deficit gaps in protein (meat) and energy (food grains) cannot be compromised as otherwise the strict trade and tariff rules and political changes/compulsions may shatter and collapse the economy of the state beyond repair. Therefore for a secure and more prosperous future we have to adopt a multipronged strategy for sustainable development which encompasses the management and conservation of the natural resource bases and orientation of the technological and institutional change in such a manner as to ensure attainment and continued satisfaction of human needs for the present and future generations. Such sustainable development conserves land, water, plant and animal genetic resources; is environmentally non-degrading; technically appropriate; economically viable and socially acceptable.

The rising discontent/unrest among the unemployed educated youth cannot be tackled by only providing the government jobs, which are becoming uncommon with every passing day. To face the future challenges, the state has therefore to gear up well in time to identify and develop the potential employment generation areas viz, livestock husbandry is one of such potential areas which if adopted on entrepreneurship basis has the advantages of diversity of commercialization, low capital investment and quick returns. For adoption of such self-employed entrepreneurship schemes, the educated unemployed youth need to be given vocational training with continuous technical support and financial assistance by the government.

Beef and dairy animals with their multiple compartment stomachs, are some of nature's marvellous converters. They consume cellulose, lignin and other carbonaceous substances in otherwise useless forage plants on the range and produce meat and mille They consume non-protein nitrogen urea in feed supplement and produce proteins. About 40% of dietary calories are met from meat product all over the world.

Beef animals typically gain only one to three pounds of live weight per day on grass, about double that in the feed lot with high energy rations based on grain. Some beef producing operation are the largest agri-business. In cow/calf operations the goals of a herd manager are to have a high percentage calf crop at the right time and have fast growing calves to sell to cattle feeders within the year. Such operations represent the grass phase of beef production, when grass feeds the cow that, in turn, feeds the nursing calf.

Genetic research in the beef industry is in the high-tech arena. The high-tech system seeks out not only high growth rate animals but also animals that produce a quality of beef to meet consumer preferences. Management of horse stables and riding schools is a rapidly growing avenue in commercial recreation and an animal science major can be one of the educational backgrounds for this.

The poultry industry today is one of the most efficient in agriculture. For years, it has produced food by utilizing lower amounts of raw material and less energy consumption then for production of any other source of animal protein. The poultry industry also is one of the most highly mechanized, from computer

- controlled temperature and humidity in the hatchery to mechanized bird - processing plants using highly specialized equipment. This complex, integrated industry provides opportunities through its five tiers.

1. Breeder farms to get the right genes in the eggs.
2. Commercial egg-producing farms to provide the eggs.
3. Hatcheries to provide the chicks.
4. Grow-out farms to produce the birds.
5. Processing plants to package the poultry products for consumers.

Targeting a growth rate of 6.7% and the requirements of 20 million human population, the J&K State would require about 60 lac tones of milk, 2200 lac kg meat, 7200 million eggs by 2030. With the future targets as challenges, unless a structured organizational base' is planned now to make it an integrated and essential part of developmental process for increased production and productivity from animals, the transition from insufficiency through self-sufficiency to surplus to feed the upcoming industry, will not be a reality. Therefore it is imperative for the policy planners now to lay strong institutional base.

TOURISM IN THE STATE OF JAMMU & KASHMIR

By : Riaz. A.. Patloo

Never in the history of the world was traveling as easy as it is now. The technological revolution and globalization has borne its fruit and the living standards of the people have improved to a great extent, spending and enjoying has replaced saving and suffering. The denizens of the global village love traveling and exploration of the new territories.

Tourism is the back bone of our state economy, the state govt. must explore new tourist resorts to attract more and more tourists from all over the globe, the govt. should provide a detailed plan for the development of tourism, if the state government is serious about it. It is pertinent to mentioned here that Kashmir valley has no other area which could generate economy except the tourism. The government has taken no steps for development of other tourist resorts except Gulmarg, and no steps have been taken by the government to exploit other tourist areas. Once tourism develops, it can boost our economy and help in resolving the problem of unemployment up to the great extent. Apart from road connectivity there is great need for the accommodation of tourist and development of other facilities like drinking water, providing 24 hours electricity etc. God has gifted Kashmir valley with beauty and various water bodies as it is said that the "Kashmir is paradise on earth" it is order of the day that government should also pay attention on various water bodies in order to protect and preserve water bodies especially Dal and Nigeen lakes there should be overall development of all the tourist resorts and at the same time government should attract the tourist from all over the world. So that we can take tourist industry to new heights.

In Kashmir valley there are many places where tourists wants to go but are inaccessible because of lack of transportation facilities. Government should provide all the facilities to the tourist resorts. So that tourism industry can grow. People who are connected with the tourism need financial support to survive their trade. It is also worth while to mention that Kashmir valley has attracted a record domestic tourist and foreign tourists in 2004.

The Jammu & Kashmir tourism is trying to attract more and more tourists from outside the state and country. The tourism department is promoting Kashmir as a favorite tourist destination. It is true that Kashmir is dream destination for tourists. Government must ensure that there should be every thing in Kashmir that tourist wants from his dream destination. We should develop new infrastructure new avenues and that will take us to a new world of tourism. In the present scenario tourism require specialized knowledge and expertise. Winter tourism and adventure sports have a great future in our state.

There is no doubt about it that the department of tourism launched a drive to develop the infrastructure in some tourist resorts but they have a long way to go and it needs an honest effort to exploit it, because there is a lot of potential available in valley of Kashmir. The sate of J&k should streamline the tourist Industry and there should be a good facilities in hotels, boarding and lodging because tourism is very important to the global and local economy and we cannot ignore this vital industry. If any body should think of travel and tourism the state of J&K should come in their minds as there are many people associated with travel and tourism industry travel and tourism encompassing transportation catering accommodation and services for traders is the worlds largest industry and generation of jobs, it should be in every body's mind that tourism industry should grow, so that every body will be benefited out of tourism industry, every body can help to promote tourism by way of keeping their surrounds and environment clean. Let us hope that 2007, will be a very profitable year for the local hotel industry. It was found that many tourist visitors have their own private transport and more percentage of visiting parties are couples and followed by families and individuals. We should keep every information available to tourists so that they may not face any difficulties and it will help tourism development for the future. There should be crystal tourism policy and tourism development from the state government so that we can take tourism industry to new heights. If we talk about tourist sector, there are two levels of analysis first there is the tourist industry and secondly the tourist economy. The tourist industry comprises the attention of visitors and there direct demand for goods and services. The importance of domestic tourism should not be underestimated as it contributes exactly double the consumption expenditure of foreign tourism at present, direct and indirect tourism demand together account for the tourism economy. We must make it sure that no inconvience is caused to the tourists.

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IMPORTANCE OF PRIVATE SECTOR

By: Fayaz Wani

Private sector has become the boon for the economy for the present day world. Nowadays, private sector is contributing more in the development of society, nation and world. After the entry of private sector, the standard of living of people across globe has improved considerably and the same is true in India as well. In India, private sector is not only playing key role in the economic growth of the country, but also providing means of better living to the people.

However, unfortunately the state of Jammu and Kashmir is lacking far behind in this sector. The state of Jammu and Kashmir, which has been witnessing turmoil since past 17 years, is in dire need of lot of investment from private sector to improve the condition of living of people. Jammu and Kashmir state is gifted with tremendous natural resources and if these riches are utilised fully, the state will become economically much richer and the per capita income of people will increase manifold.

Over the past 17 years, the turmoil in state had been a big hurdle for the private sector to enter into the state. However, the ground situation in the state, according to government is showing a marginal improvement and hence ground situation should not be any problem for the private companies in entering Kashmir Valley, once called "Paradise on Earth" and utilising its natural resources to its full. No doubt, few private sector companies have entered the Valley, but entry of few companies in a certain field (and that too in the area where they are not tapping the natural resources of the state) would not be suffice.

Fayaz Wani is presently working for National Daily Rajisthan Patrika

The Jammu and Kashmir state has got potential of producing thousands of megawatts of cheap electricity as nature has bestowed abundant water resources to the state. Till date even 10 per cent of the water resources of the state have not been utilised and as such the state faces tremendous electricity crisis during winter months. Private sector can tap this sector easily and produce thousands of megawatts of electricity, which can lit up not only state of Jammu and Kashmir but entire North India. By tapping the water resources, the electricity woes of state and North India can be overcome and this will in turn help in the development of the region. With uninterrupted and cheap electricity available, big companies can come and set up their factories and industries in state, thus bringing industrial revolution in the state, where it is needed most.

Besides, overcoming the power crisis of North India, these companies can also help in curbing the unemployment in the region by providing jobs to the local youth in these power generating units. No doubt the technical-know how can be brought from outside state, but the skilled labour can be easily hired from within the state. Thus setting up of power generating units by the private companies will serve three purposes. I) the power scenario of the state will improve, and it will automatically help in the development of the state. The state can economically more vibrant. ii) The unemployment can be checked to a certain extent by providing employment to unemployed skilled youth. Thus life standard of thousands of families, whose kiths and kins will absorbed in these power generating units, will improve and thousands of families can lead a decent life. iii) Last but not the least, the company setting up power generating unit is going to earn lots and lots of revenue for the time to come, without any threat of loss.

The setting of power generating units will be a major step towards bringing industrial revolution in the state of Jammu and Kashmir. With cheap electricity available round the clock, the big houses can set up their industrial units in the state without any hiccups. The setting up industrial units will automatically generate employment to the unemployed youth of the state and hence go a long way in curbing the menace of unemployment in Jammu and Kashmir.

But, unfortunately, no private sector company has yet shown inclination towards tapping the water resources of Jammu and Kashmir to generate the electricity. The government needs to encourage the big companies to come to the state and invest in power generating units.

The tourism industry is another such industry, where the private sector has a big role to play. The tourism infrastructure in the state is not the best and the private sector can help in estabilishing world class tourism infrastructure in the state. The private sector can also help in developing the tourism spots in the state so that tourists going to other parts can be lured by the world class tourism facilities in the state. With world class tourism infrastructure and facilities available in the state, more and more tourists can come to the state to enjoy the natural scenic beauty bestowed on the once called "Paradise on Earth".

INFORMATION TECHNOLOGY AND ITS ROLE IN DEVELOPMENT

By: Mehraj-ud-din

The Valley of Kashmir is geographically situated at such a place on the world map which puts several disadvantages for its development. Naturally we have to face several odds and impedances which can be overcome only once we think ahead of others in the region and accordingly develop strategies which give us distinctive advantages over others. Although we must keep in mind that Almighty has given us some other advantages which we need to capitalize and it is a fact that most of the developed nations in the world have same type of climate and recourses as we have. The Government of the J & K has been introducing several schemes for the economic welfare of the people but mostly they do not meet the requirements and have not yielded the due dividends. In this issue I propose several potential areas of our economy which can be influenced by the application of the Information Technology.

1. Horticulture
2. Handicrafts
3. Industry
4. Tourism
5. Employment
6. Education

In some of these areas like horticulture, handicrafts and tourism sometime back when there was not enough of competition we have shown our worth and at times were in complete control of the situations but unfortunately have not been able to sustain the lead. Therefore the Government of the J & K needs to

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Mehrjaj-ud-din is presently working as additional controller examination University of Kashmir rethink and develop strategies which shall be aimed at giving a lead to the people of J & K over others. It should not be mistaken that I.T does not have any role in other areas but the fact is that it has made inroads in every sphere of the life. Therefore other sectors like administration, electrical distribution system and its revenue system, project management, public distribution system, maintaining revenue-records etc can greatly be facilitated by the process of automation however to begin with only some of the areas need to be considered.

In Kashmir the business units are owned and managed mostly by moderately educated to illiterate persons. They lack the professionalism involved in the business and cannot work in a culture involving competition. With very little exposure and almost no requisite information the most of the decisions taken by them from time to time are wrong and result in losses rather than in profits. Even in highly established business families in Kashmir the educated members in them mostly opt for Government services rather than involving in family business. Therefore Government policies have to be designed in such a way that on one hand the educated people too are attracted as well as involved in the business and on the other hand sufficient support is provided to the little or uneducated persons also to run their business.

Horticulture:

The Horticulture as per the government estimates generates a revenue of 1000 crore form fresh fruits and about 300 crore from the dry fruits. In my opinion it must be directly or indirectly involving maximum number of families in Kashmir. The government has introduced the market intervention scheme and some other facilities in the sector to help the business grow but there is a good scope to develop it further. The Information technology has a wonderful role to play especially in the monitoring the flow of fruits as well as in the support for the marketing. The govt. needs to establish information centers at district levels or in the fruit complexes as well as in all the main markets in India. These centers should not only provide comprehensive information but also generate a sense of competition among the growers, dealers in this business commissioning agents. The Information Centers at the marketing centers would be feeding the following information on daily basis:

a) Rates of different verities.

b) Name of the Party whose fruits cost the highest and the party which cost the least along with the other remarks.

c) Name of the Party which sold at the highest price.

d) The freights paid by different parties for the carriage of the goods.

e) Quantity of fruits received.

f) Quantity marketed and quantity left over.

The above information must be available at all the information centers in the Valley. This information must be processed at these centers in the valley which must function as decision support systems for the growers and dealers of the business. The department of Horticulture must regularly advise the concerned about the future plans. They may also involve experts in the marketing field from reputed institutions to deliver special lectures to the dealers based on the information. These centers in fact should become nerve centers of the marketing and must be decisive in regulating the flow of fruits to outside markets. The more comprehensive the information the better would be the decisions and hence it has to be ensured that maximum related information is provided that too at right time.

Based on the above information the following reports may be generated daily, weekly as well as at the end of the year:

1. Average Rates per box of the different varieties of the fruits.
2. Growers who fetched the maximum and the minimum per unit box during the year citing the reasons.
3. Consumption at different markets on daily basis, Average consumption as well as the peak consumption and the peak times.
4. Markets which fetched maximum and minimum per box.
5. Total consumption of the fruit.

6. Estimated total demand of the fruit.
7. Variety wise rates and consumption in different markets.

This type of information needs to be given wide publicity among the growers and need to be advised accordingly.

Handicrafts:

Handicrafts have been our one of the fundamental sources of the revenue and it too feeds lakhs of our families. Its turnover per year is manifold than all other sources of revenue. It is the inherent strength of this craft that is keeping the trade alive under the fiercest possible competition. The Government of J & K as usual has been giving certain incentives from time to time to the traders in this field to ensure that the business flourishes. As is true with horticulture mere incentives are not going to strengthen the fundamentals of this business but it needs modernization so that it is capable of competing in the international market and also provides substantial benefits to the people involved at all the levels.

The IT can play its role both in the manufacturing as well as in the marketing of the Handicrafts. The most important of all the steps in this sector is to provide supporting system to the manufacturers in producing quality and attractive designs in addition to the conventional designs which we have been producing since centuries. The computer graphics is one of the potential areas of the Information Technology which can be used to develop wonderful designs. Be it Carpets or other high cost handicraft product the Computer Graphics can be used to develop an excellent supporting system which besides generating the latest innovative designs would also reduce the efforts involved in the designing. It has been found that because of the non existence of such a supporting system no new designs are produced. The textile industry and ready made garments manufacturers has been using such facilities from the past several years now. It must be kept in mind that it is not only the stuff of the product only which matters these days but the design also plays very important role also. In this regard again the Government can establish these centers at district levels where designing facilities would be provided to the people. These centers would be placing the entire designs on the Web and the same can be accessed anywhere in the world. Besides hosting these designs the website would also contain the information about the manufacturers as well as the rates of these products. The government can also list the registered centers where these products can be purchased. It has been found in this trade that lot of duplicity has been introduced and the buyers often get cheated.

One of the most important factors in the handicraft industry is that the real weaver or the worker gets much less wages as compared to those who are involved in its trading. If quality products are to be manufactured then these workers have to be paid reasonably and that will ensure the growth of the business also. This is possible only once more and more transparency is introduced in the trade at different levels and IT can play a significant role it. The Govt. has established its showrooms in all the main cities in India where the different products are put on sale. It is proposed that I.T facilities be established there also which shall contain the comprehensive information about the Handicrafts of the Valley. Similarly the feedback from the customers also needs to be collected and processed for further development.

Industry:

In this sector I discuss two industries :

a) The I.T industry and

b) Conventional industries.

The geographical location of the Valley puts its conventional industrial system simply at a disadvantageous position because it does not have any significant market besides the availability of raw material is also acute. It is a fact that in India the Mumbai which is the industrial or the commercial capital of the country as it contains major portion of the heavy industry could not grab the equivalent share of the I.T industry. This is because although Mumbai has a suitable industrial environment for the conventional industries, the I.T industry grew with an unprecedented pace in Banglore, Hyderabad and some other places. This simply implies that industrial environment for the conventional industry is different from what is required for the I.T industry.

Unlike conventional industry there is no requirement of raw material. Similarly the market scenario is also quite different from the conventional industry. The most important factor in the development of the I.T industry is the human brain. This is because the conventional industry is labor oriented while as the I.T industry is an intelligent one involving the application of the mind. Associated with the software development forming the final product of the I.T industry is an admitted fact that it is deeply influenced by the art rather than science. The brain of Kashmir's is predominantly artistic and hence in my opinion is most suitable for this industry. This is substantiated by the fact that those computer professionals who have got such opportunities outside have been doing wonders and moved ahead of their own contemporaries.

If the government is serious in developing this industry then there is no alternative in establishing few high end Computer Institutes. There is no doubt that we have a good number of professionals which posses requisite academic degrees like Masters in computer Applications (MCA) , Bachelor of Engineering (BE) in Computer Sciences and allied areas. But with this degree at their back they still require 3 to 6 months training in high end areas. Such courses are essential for a computer professional to get into the Software development and are offered at many places in India at very high prices. Professionals with such trainings are treated as most skilled ones and get absorbed any where in the world. Besides this they get all the necessary skills to start Software development which meets the international standards. To begin with one such Institute can be started in the Kashmir and the other one in Jammu with start of art facilities in terms of I.T facilities, accommodation, faculty etc. The earlier such Institutes are established the better it would be as the field of I.T is progressing at unprecedented pace and lagging behind at this stage may ultimately close our doors for ever in this field also.

A good number of our professionals are doing wonderful job in I.T in USA and other countries. They too have a desire to contribute towards the development of this industry in J & K. In fact their suggestions and services are invaluable for the development of the industry as they have gained significant experience in the area. It is an irony that we have not bothered to gain out of their experience. These professionals can be made visiting faculty members of these advanced Institutions and provided opportunities to contribute towards the development.

The government also needs to review the performance of the Software Technology Park set up at Rangreth. By all standards it has not been able to deliver anything substantial. Instead of relaying on one single person the government needs to constitute a committee of few experienced professionals in the area to manage such assets which would frame the policies so that the only prospective industry of the valley flourishes.

The I.T has a role in the development of the conventional industries also. In this case the District Industries Centers need to be modernized. As on date they are just providing registration facilities and government incentives both of which cost the aspirants dearly. For these industries to grow these DIC centers must function as supporting centers providing all the requisite information to the unit holders. The establishment of I.T support with internet facility can ensure availability of requisite information to the unit holders. These centers can provide information about the raw material; cost etc required by the manufacturers as massive databases about the raw material suppliers is available on the net. Similarly they can also help in marketing by providing the necessary contacts to the unit holders.

Tourism:

Tourism is the most profitable area among all the trades presently running in the Valley. It is needless to mention that Almighty has bestowed Kashmir with unparallel beauty and landscape. Like other trades the tourism sector also can be highly benefited by the introduction of the Information Technology. For the development of the tourism the government has to ensure that the people interested in traveling are provided maximum information about all the tourism related activities. In this regard the Government again needs to set up Tourism Information Centers at various potential places in India. Besides these centers the most comprehensive website about the tourism also needs to be developed. This website must contain the information like distance from the Srinagar, roadmap, hotel facilities along with the rates, facilities and all other related information. Through this website online enquires also needs to be provided to the tourists and must contain the facility to post their complaints as well as their suggestions. The tourists must be provided the online facility for booking the rooms in different hotels acquire full list of facilities provided in these hotels.

The Tourism department must also maintain a complete database of all the tourists who visit the Valley along with the remarks about their experience here. The experience of those who travel here should be the most important of all as this would be the first hand information. This database must be processed by the tourism department and proper feed can be obtained to develop the facilities for its development. Similarly the database can be made accessible to the people who are interested in traveling to Kashmir to share their experience here. It may be mentioned here that the manual processing of such a huge data is not possible. The computers will make it possible to process the data on many parameters like peak days, weeks and months, potential areas where from maximum flow was found, places liked the best by the tourists, performance by different hotels and so on. Based on this information a lot many decisions can be taken at different levels for the development of the industry.

Employment:

Employment is another important area where I.T can play some significant role. One of the most difficult problems faced by our educated youths in getting jobs outside the state in reputed organizations is the lack of proper information about their recruitment policies, dates of recruitment and so on. The educated youths in this regard need to be provided maximum support by way of providing the requisite information and arranging the logistic support for their recruitment. In this regard the employment exchanges need to be modernized to meet the present day requirements. The Internet has made it possible to access any organization and collect any kind of information from them. Similarly a very large number of websites are available which offer the employment services to the people. These employment centers should adapt to these changes and function in these changing scenarios. The Employment centers should create a database of all the unemployed persons with comprehensive curriculum vitae's. They should remain in constant touch with the organizations offering employment and mail the relevant candidates curriculum vitae's to them. These centers should also arrange their interview preferably using video conferencing facilities. These employment centers should also monitor the requirements in the market and accordingly segregate the enrolled candidates who can be upgraded to meet these requirements with minimum efforts. The employment exchanges should also arrange special lectures for the candidates appearing in the interviews to infuse confidence in them and prepare them for facing the interviews.

The employment exchanges can get software's developed which can contain data banks of questions of different standards on different subjects. Such software's would be interactive in nature and candidates can work with them and assess themselves. One such project is already under development in the P.G Department of Computer Sciences, University of Kashmir and can be of immense use to the employment exchanges for preparing the candidates to face any standard of interview.

Education:

It is the age of information and knowledge. Societies possessing these assets are progressing very well even if they do not have natural resources. The countries like Japan are an example. For infusing I.T culture in the society the education sector is the most appropriate and powerful area. Special attention has to be given to this sector as it is going to make the fundamentals of the I.T strong in the society.

The I.T infrastructure in all the educational institutions needs to be developed and students need to be given requisite education of I.T. The Government on this account has already deputed hundreds of its teachers for acquiring the I.T education by enrolling them for "O" and "A" level courses run by some Institutions in Kashmir and Jammu. The Government has in fact spent huge money on their training but it should not have any confusion in the fact that the mission is a failure. It seems that the entire exercise has been taken in haste without deliberating much on it and I apprehend that no expert opinion has been sought. Primarily it must be admitted that these courses run by the DOEACC society are tailored towards producing manpower for industry whereas the education department requires professionals for teaching. In fact the curriculum to be taught should have been deliberated thoroughly and similarly quality teaching and training arranged.

As already said the I.T field is one amongst the most dynamic fields and can outdate a well qualified professional if he remains out of field for even brief period. Therefore training and teaching of the teachers is continuous process and cannot be managed by the present arrangement. The education department needs to set up its own Computer Training Centers at district levels to ensure rigorous training to its teachers periodically. It would be otherwise impossible for the department to coup up with the developments in the field and to train the employees periodically to keep them updated with the latest advancements would be very costly. Now we have good number of candidates with MCA and BCA Degrees and academically stand most suited for teaching purposes. These courses make the fundamentals of the students very strong and make them highly suitable for teaching purposes.

There is huge disparity between Govt. and private schools in the level of Computer Education imparted to students at school level. In private Schools it is imparted from primary level which is never producing the due results and is unnecessarily adding burden to the children. In Govt. Schools it is imparted at higher secondary level at which the students have other priorities and cannot concentrate on Computer education which in the beginning needs substantial efforts. Therefore the education department needs to keep a balance and in my opinion the Computer education should be started at 6th standard beginning with small dozes and continue up to 10th standard at which one of the papers should be exclusively on computers constituting all the topics studied from 6th standard. At higher secondary level it can be listed as one of the optional papers or as an additional papers. The Computer Sciences is a bit different from other conventional courses and hence proper care has to be given while it is introduced. The way a person can never learn driving unless and until he is made to practice with an auto mobile similarly a person cannot appreciate the computer education without making him to work on the computer. Such an environment does not exist in majority of our schools both in government as well as in private sector. The computer education can be categorized into three sections a) awareness level and b) application level and c) Expert or professional level. The target at the school education should be primarily awareness level with some portions of the application level. At higher secondary level the application level can be further enhanced and expert level should commence from graduation only.

Conclusion:

At the end it can be concluded that serious thought has to be given towards the modernization of our various sectors. The government can set up a committee of I.T experts which can advise it from time to time in different I.T related projects. This way the chances of failures of different I.T missions would be minimized and full advantage of it can be taken. Considering the fact that for over all development better governance, transparency, strong communication and better monitoring is required therefore I.T has a significant role in all these activities. Any laxity in the proper implementation of I.T is bound to cost dearly to the development of the State.

A STUDY OF MENTAL HEALTH AND ACADEMIC ACHIEVEMENT OF ADOLECENT BOYS AND GIRLS

BY: N.A. Nadeem & gulnaz

One doesn't have to be superhuman to be mentally healthy. If one is human besides being humane, one can safeguard one's mental health. Occasional bouts of anger or anxiety do not brand a person neurotic. So long one does not become so disruptive as to be calmed by drugs or shocks, one is supposed to be reasonably adjusted to reality. A mentally healthy person is well adjusted to social norms, cheerful, socially considerable, accepts reality, satisfied with his vocation, and gets along with minimum of friction and tension and remains optimistic in life. Mental health is a condition and a level of functioning which is socially acceptable and personally satisfying. The term 'Mental Hygiene' refers to the development and application of a set of practical principals directed towards the achievement and maintenance of psychological well being of human organism and prevention of mental disorder and maladjustment (Bernard, 1951, PP. 176-18: Thorpe, 1950, P.6). Mental hygiene means establishment of environmental conditions, emotional attitudes and habits of thinking that will resist an inset of personality maladjustment. Its aim is to help all persons achieve fuller, happier, more harmonious and more effective lives (Klem 1944, P.22) If all persons who deal with others especially parents, teachers and employers, were governed by the requirements for mental health there would have been fewer unhappy and inadequate personalities for clinicians to treat. The constructive measures designed to develop effective personalities are termed positive mental hygiene.

The seventeenth century has been called the age of enlightens. The eighteenth, the age of reason; the nineteenth, the age of progress; and twentieth, the age of anxiety (Coleman, 1998). Although the path to a meaningful and satisfying way of life has probably never been an easy one; it seems to have become increasingly difficult in modern times . Ours is the age of tremendous growth of knowledge and rapid social change. More scientific and technological advances have been made in the past fifty years than in all previous recorded time; for many people the pace of change is simply too fast resulting in what has been termed future shock. Modern science & technology effects all phases of our life. At the same time traditional values and beliefs no longer seem self evident; we lack the comforting religious and social absolute that provided security for our forebeary. And often we seem unable to anticipate and prepare for the problems that confront our society or to foresee the consequences of group decisions and action until the results approach catastrophic proportions. Thus, for the development of society in the scientific & competitive age, it is the teacher who can teach mental hygiene to the children in the class which in turn, can maintain balanced mental health. If the present trend continue it is estimated tht one person in ten now living will at some time require professional treatment for such emotional disturbances. Furthermore this figure says nothing of the many kinds of organic illness brought on an aggravated by emotional conflict and tension. Abnormal behaviour has for good reason been designated the country's number one health problem.

OBJECTIVES OF THE STUDY:

The objectives of the present study were framed as under:

1. To study mental health of adolescent boys & girls.
2. To study the academic achievement of boys & girls.
3. To compare boys and girls on their mental health and academic achievement
4. To examine the relationship between mental health and academic achievement.
5. To compare high & low achievers on their mental health status.

HYPOTHESES:

The following hypotheses were formulated for the present study:

1. Boys and girls do not differ significantly on their mental health
2. Boys and girls do not differ significantly on academic achievement.
3. There is positive relation between mental health and academic achievements.
4. High and low achievers differ significantly on their mental health status.

SAMPLE:

The study was conducted on a sample of 400 students (200 boys & 200 girls) of 9th & 10th standards selected randomly from 8 private secondary schools of Srinagar city.

TOOLS:

Following tools were used for the present study:

TOOL I: Mental Health Battery

Mental health Battery by A.K. Singh & Alpana Sengupta was administered to asses the Mental health of persons in the age range of 13-22 years. It is a battery of 6 dimensions and items for each part are separately written:

The dimension of mental health covered through this inventory include Emotional Stability, overall adjustment Autonomy, Security insecurity, Self Concept. General Intelligence

TOOL II:

An Information Blank was constructed to collect the information regarding family background, parental education and occupation and other personal particulars of the subjects.

Analysis and Interpretation

In order to achieve the objectives formulated for the present study, the data collected was statistically analyzed by employing "t" test and correlation statistics.

The analysis of the data was carried along the following lines:-

A). Comparison of Boys and Girls on Mental Health

TABLE 1.0 SHOWING COMPARISON OF BOYS AND GIRLS ON VARIOUS AREAS OF MENTAL Health (N=200 in each case)

Areas of Mental Health	Boys	Girls	't' Value	Level of Sig.
Emotional Stability	M= 8.54S.D= 2.13	M=7.65SD=2.09	4.55	.01 level
Autonomy	M= 10.72S.D= 2.13	M=10.32SD=2.20	1.90	Not Significant
Security insecurity	M= 8.62S.D= 2.23	M=8.69SD=2.04	0.33	Not Significant
Self-Concept	M= 8.98S.D= 2.36	M=9.18SD=2.01	0.95	Not Significant
Intelligence	M= 19.27S.D= 3.49	M=18.99SD=3.26	0.035	Not Significant
Overall adjustment	M= 25.14S.D= 3.97	M=24.5SD=3.58	1.72	Not Significant

The perusal of the above table shows that two groups differ significantly on emotional stability dimension at .01 level. The mean Score of boys is higher than the mean score of girls which indicates that the boys group is emotionally more stable than the girls group. The above table also reveals that boys and girls do not differ significantly on overall adjustment, autonomy, self-concept intelligence and security insecurity dimension of mental health. This implies that both boys and girls have similar overall balance between their demands of various aspects of environment on the one hand and cognition on the other. Both the groups have similar independence and self-determination in thinking. Both have a same sense of safety confidence, freedom from fear, apprehension, or anxiety particularly with respect to fulfilling the person's present or future needs.

B). Comparison of boys and girls on Academic achievement

Table 2.Showing comparison of boys and girls on academic achievement

	Groups	Mean	SD	't' Value	Level of Sig.
Boys	76.95	3.78	7.23	0.01	
Girls	79.7	3.80			

The above table reveals that two groups differ significantly on academic achievement at 0.01 levels. The mean score of girls (79.7) is higher than the mean score of boys (76.95). This implies that girls have excelled in academics than the boys.

C). Correlational analysis

A 7x7 correlation matrix was worked out separately for boys and girls to find the relation between mental health and academic achievement.

TABLE 3.1: TABLE SHOWING CORRELATION MATRIX (7X7) INCASE OF BOYS (N=200)

Emotional Stability	Overall Adjustment	Autonomy	Security Insecurity	Self-Concept	Intelligence	Academic	Achievement
Emotional Stability	*	.337*	.173**	.166**	.036	.182*	.22*
Overall Adjustment		*	.191*	.246*	.058	.055	.45*
Autonomy			*	.178**	.185*	.85*	.20*
Security Insecurity				*	.174**	.036	.39*
Self-concept					*	.116	.20*
Intelligence						*	.78*
AcademicAchievement							*

** = Significant at 0.01 level ** = Significant at 0.05 level*

TABLE 3.2.: TABLE SHOWING CORRELATION MATRIX (7X7) INCASE OF GIRLS (N=200)

Emotional Stability	Overall Adjustment	Autonomy	Security Insecurity	Self-Concept	Intelligence	Academic	Achievement
Emotional Stability	*	.274*	.038	.033	.025	.012	.142**
Overall Adjustment		*	.135**	.252*	.214*	.024	.0280*

Autonomy	*	.098	.003	.339*	.131**
Security Insecurity		*	.087	.079	.210*
Self-concept			*	.10	.22*
Intelligence				*	.70*
AcademicAchievement					*

* = Significant at 0.01 level ** = Significant at 0.05 level

Table 3.3: Showing correlation between six dimensions of Mental health (emotional Stability, overall adjustment, Autonomy, Security insecurity, Self concept & intelligence) and Academic achievement of boys and girls.

Components	**Coefficient of correlation**	**Boys (N=200) Girls (N=200)**
Academic AchievementvsEmotional Stability	.22*	.142**
Academic AchievementvsOverall Adjustment	.45*	.280*
Academic AchievementvsAutonomy	.20*	.131**
Academic AchievementvsSecurity Insecurity	.39*	.210*
Academic AchievementvsSelf –Concept	.20*	.22*
Academic AchievementvsIntelligence	.78*	.70*

*= significant at 0.01 level ** = Significant at 0.05 level*

It has been shown that in case of boys (N=200) the value of coefficient of correlation is highest between intelligence and academic achievement (0.78) followed by coefficient of the value of .45 between overall adjustment and academic achievement. At the third place comes the relationship between security-insecurity and academic achievement (r = .39). Emotional stability has also been found to be significantly related to academic achievement (r =.22) Autonomy and self concept are also positively and significantly related to academic achievement (r =.20 in each case)

Similarly, the six correlation coefficients worked out between achievement and emotional stability, over all adjustment, autonomy, security, self-concept and intelligence in case of girls (N=200) have been found significant at .01 level except on two dimensions, emotional stability and autonomy, which are significant at 0.05 level. It is evident that in case of boys as well as girls academic achievement has been found to be positively and significantly correlated with the six dimension of mental health. This indicates that higher the subjects on various indices of mental health, higher will be their academic achievement. It shows higher the emotional stability, the higher will be the academic achievement, higher the autonomy, higher the academic achievement, higher the self- concept higher the academic achievement higher the level of general mental ability higher the academic achievement.

D. Comparison of High and Low Achiever on Mental Health

The high & low achievers on the basis of academic achievement were compared on six dimensions of mental health battery.

Table 4.0: Showing comparison of High/ Low achievers on six dimensions of mental health viz, emotional stability, over all adjustment, autonomy, Security- insecurity, self- concept and intelligence.

Dimension	Group	N	Mean/SD	't'	Value of Sig.
Emotional Stability	High AchieverLow Achiever	108108	10.64/1.968.43/2.48	7.62	.01
Overall Adjustment	High AchieverLow Achiever	108108	25.92/1.0724.75/1.97	5.51	.01
Autonomy	High AchieverLow Achiever	108108	10.92/1.9210.00/2.18	4.00	.01
Security –insecurity	High AchieverLow Achiever	108108	9.34/2.007.54/1.74	8.18	.01
Self Concept	High AchieverLow Achiever	108108	9.49/1.978.75/2.15	2.64	.01
Intelligence	High AchieverLow Achiever	108108	20.7/3.2817.75/3.68	6.11	.01

The table 4.0. Shows that the two groups differ significantly on mental health status at 0.01 levels. It is evident from the table that the group with high mean score on six dimension of mental health viz, emotional stability (10.64), Overall adjustment (25.92), autonomy (10.92), security insecurity (9.34), self concept (9.49) and intelligence (20.7) are higher than the group with lower mean score vix, emotional stability (8.43), over all adjustment (24.75), autonomy

(10.00), security insecurity (7.54), self concept (8.75) and intelligence (17.75). These figures reveal that the group with higher mean score have stable feelings an over all harmonious balance between the demands of various aspects of environment on one hand and cognition on other hand, high sense of safety, positive attitude and knowledge towards themselves and evaluation of their achievements and high general mental ability than group with low mean score.

DISCUSSION OF RESULT

The present study is a modest effort to throw light on the impact of mental health on academic achievement. The discussion of the results based on the analysis & interpretation of data is presented in the foregoing pages. The results are discussed as under:-

I). Comparison of boys and girls on Mental health Status.

II). Comparison of boys and girls on Academic Achievement.

III). Comparison of High and Low Achievers on Mental Health.

IV). Comparison of High and Low Achievers on Mental Health.

Comparison of boys and girls on Mental Health Status:

The boys and girls compared on six dimensions of mental health status viz (Emotional stability, overall adjustment, security- insecurity, self concept and intelligence). On emotional stability dimension, girls have been found emotionally unstable than boys. The results are in the line with the investigation carried out by Mellabby, Jane, Martin, Maryanne O' Doherty, John (2000) the investigators have showed that women have negative emotions & men have high self esteem. Sprowls (1978) aspect of adjustment was considered. Pathak (1970) found that girls had more problems than boys in each area of adjustment. Webb ad Allen (1979) arrived at the conclusion that women evidenced more psychological distress than men.

On other five components of mental health status overall adjustment, security-insecurity, self-concept and intelligence both boys and girls are found to have similar over all harmonious balance between the demands of various aspects of environment, independent and self apprehension or anxiety, sense of security confidence freedom from fear, apprehension of their achievements and general mental ability which helps the achievements. In view of results discussed above the first hypothesis stands partially accepted. However, on emotional stability dimension where boys were found more stable than girls. The findings are in time with the findings of Kakar (1967), Achenbach (1981) and Khurana (1986).

Kakkar (1967) reported that adjustment problems of adolescent boys do not differ significantly from those of girls. Achenbach and Edelbrock (1981) showed no significant gender difference in total behavior problems. Ghouse and Khurana (1986) found that there was no significant difference between boys and girls in their level of adjustment.

Comparison of boys and girls on Academic Achievement:

Boys and girls were compared on academic achievement the result reveals that girls have high academic achievement than boys. The null hypothesis which reads, "Boys and girls do not differ significantly on academic achievement". stands rejected. The results are inline with studies carried out:- As Wilberg, Syswra & Lynn, Richard (1999) showed girls can equally better with boys. O' Doherty, John (2000) found that gender gap is not important in academic achievement.

Correlation between Mental health & Academic Achievement:

The scores of mental health on six components and average percentage of academic achievement compared, indicates that mental health and academic achievement is positively correlated. Psychological well being is an indicator of high academic achievements. The hypothesis which reads as, "There is positive relation between mental health and studies carried out by Cardaci, Marizio; Gangemi, America, Marafliota, Antonino & Spirini. Giovanni (1998) who reported operational intelligence and school learning in children are closely related. Difficulties in operational reasoning predict assurance of learning problems. Backerls, Kelsey and Wheelor millers Ville, V (2001) reported mental health issues as having an impact in academic achievement Anand S. P. (1989) mental health and academic achievement is positively related. Kobal correlation between academic achievement and various indices of self concept (verbal, academic, relations with same sex peers, relations with parents, religions and spirituality and general self concept.

Comparison of High and Low Achievers on Mental Health:

The mental health scores on six components and academic achievement calculated and compared indicates that the students with high academic achievement have high over all adjusted behavior than the students with low academic achievement. The hypothesis which reads'" "High and low achievers differ significantly on their mental health' stands accepted. The results are inline with the investigations conducted by, Anderman Eric M; Anderman, Lyneer, Grisesing Trippmastery goals. Abu, Hilal, Maher. M. (2002) showed self concept are related positively to both performance and Mastery goals. Abu Hilal MaherM. (2000) showed importance so efforts were positively related to achievement which in turn have a positive path coefficient to self concept and negative path to anxiety. Mc Call, Revert B. (2000) found that under achievers show more disruptive, impatient and aggressive behavior in school and perhaps at home Stein, with effective learning. Marchant, Geegory, J& Paulson (2001) showed high achiever who are satisfied with their achievement and believe school is important have the highest level of school functioning, low achievers have worst teacher have worst teacher relations and worst perceptions of students behavior.

THE KASHMIRI CUISINE CONNOISSEUR'S DELIGHT OR GASRONOMICAL BLIGHT

By: Prof. M. A. Sofi

Quite a lot has been written and spoken about this topic in recent weeks and months, so that the need for writing about it again does not really arise. However, considering that the harmful effects on society accompanying these social customs are now well-documented and can no more be swept under the carpet, constrains me to visit this topic yet again with a view to highlight the inadvisability of continuing with these practices that are going to cost us very dear in terms of our social health and physical well being. What I am referring to is the ghastly spectacle that has been in sight over the past few years, especially during the festive season of marriages in the valley. The ostentatious display of wealth during the marriage ceremonies, especially while serving the banquet to the 'baratis' has never been witnessed before at this scale. The gargantuan menu that is currently served, especially to the entourage accompanying the groom may be billed as monstrosity of a gourmet that defies all the canons of good taste. One is at a loss to understand what really does this carnival of cuisine achieve for the host who seems to be motivated by the single-most desire of impressing the guests with his health and wherewithal. Although the desire to impress other's with one's wealth and possessions is an age-old human trait, the sheer savagery with which one tends to hammer home his material superiority in this part of the world beggars all description. The time-honored, old and original seven-course banquet that Kashmir would rightly boast of, has given way to what can hardly be passed for

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Prof. M.A. Sofi is presently working as Dean Academics University of Kashmir that delicious Kashmiri feast, the so-called *Wazwan*, that is cherished as a great gastronomical delight by food lovers all over the world. It is indeed a case of transition from the sublime to the grotesque as the original two-kg odd menu of mutton for each party of four guests has given way to a mind-boggling five kg's, without making the meal a trifle tastier!

It sounds bizarre-but it is true - that when the obvious dangers and baneful consequences of extravagance during such social functions are brought to the notice of these merchants of venality, they are often seen to scoff at what they perceive as a conservative, orthodox and retrogressive world-view. Their plea that such carousals- being held as they are on very specific occasions-ought to be celebrated with pomp and fanfare is simply preposterous, what with the earnings of an entire life-time that go down the drain in one fell swoop. The fact that not less than half of the foodstuff is wasted and consigned to a *nallah* or a gutter, qualifies this social custom not only as extremely repugnant but also as a ghastly crime against nature. This is because the organic waste at such a grand scale is a known environmental hazard, with grave consequences for the already-fragile eco-system. Those taking refuge in the patently flawed logic of cultural heritage and the age-old tradition of Kashmiri hospitality, ought to remember that our tradition-rich heritage has bequeathed to us the culture of conviviality and not the culture of cannibals as is witnessed on such occasions. It is nobody's case to advocate an abandonment of our healthy traditions and all that goes with it. The fact is that our culture has so many other things attached to it that we would do well to espouse for the betterment of our self and for the betterment of our society. The Sufi tradition that we never tire of boasting as part of our ethos and culture exhorts simplicity in our actions, thought and belief and as such is in stark contrast with the 'caveman culture' that has been allowed to overtake us, especially during such festivities. If anything, sitting down with bated breath on a 20-odd course meal comprising exclusively of mutton and assorted variety served to baratis is plainly an exercise in overkill that borders on masochism, if only because the side effects of this indulgence far outweigh the positive effects, if at all there are any.

During my recent encounters with the invitees at several of such receptions, I would hardly come across one who at the end of it would confess to having enjoyed the 'feast', after having feted himself to such a treat. One doesn't fail to witness that nowadays those who attend it look upon partaking of the feast as a great mortification. This is because the sheer volume of the feast is so off-putting that even the greedy gluttons find themselves hard put to it, once treated to what is literally the devil's dinner. While the medical effects of binge eating are well known and need not be overemphasized, the fact remains that the larger implications on morality, ethics and the social health are too many to reckon in sufficient detail. It bears recalling that whereas the holy Prophet is known to have expressed revulsion against over-eating, the fact is that overeating dulls the agility as well as the intelligence of a man. In a recent interview that had appeared in these columns a few days ago, the noted gastroenterologist Dr.M.S.Khuroo had darkly hinted at the prospects of a rare epidemic involving liver diseases, hitting Kashmir in near future with its root cause in overeating, especially during wedding ceremonies. But that is by no means a reason to avoid the feast at all costs- partaking of it in measured quantities without resorting to overeating is perfectly in order and indeed an eternal delight for those wishing to tease their taste buds with what can otherwise be billed as exotic nonvegetarian food. Suffice it to say that hunger on earth exists not because there aren't enough food grains available, but because there is an iniquitous and inequitable_distribution of food amongst the peoples inhabiting this planet. The shameful evil of poverty and hunger can only be eliminated if the distribution of food was ensured equitably which entails a minimum possible wastage of foodstuff, especially during such functions. The colossal wastage of precious food-items and the squandering away of the resources is plainly obscene and is tantamount to eating into the share of those who are left starved for want of food. No wonder we may pass into the footnotes of history as a people who suffered and then perished because they wallowed in the wastage of precious foodstuff. It is never too late to see reason and call it quits, or else our willingness to continue in this self-destructive over-indulgence may well land us in a position from which there will be no escape. History is replete with instances where people perished because they continued to persist in those abominable practices against which they were forewarned time and again. Unless we take immediate steps to banish these banalities from our midst, we are condemned to go the way of those who like the *'Quam-e-lut'* were cursed and wiped out of existence for persisting in a sin exactly as we are persisting in the odious practice of ostentation and lavishness. Although comparisons may be far-fetched, the spectacle of an acute shortage of food items witnessed during the past winter following prolonged closure of the national highway should serve as an eye-opener. To complicate our predicament, we enjoy the dubious distinction of being the most notorious consumers of meat in the country, what with our almost exclusive dependence on everything from our staple diet namely, rice and mutton besides vegetables to assorted other eatables being 'imported' from other parts of the country, without caring to produce them locally to meet such a humongous demand for these items.

What is indeed needed is not a renunciation of our age old tradition of hospitality, conviviality and culinary skill which is legendary, but a willingness to rein in what appears to be a wild propensity to wasteful expenditure and which threatens to be a sure recipe for our decimation. It would certainly help matters if the laws were legislated which would make it a cognizable offence to make a splurge during wedding ceremonies, especially on food-items. Although a half-hearted effort was initiated in this direction by the government last year, the plan had scuppered for a variety of reasons, not excluding the much-flaunted 'intense public pressure', which was cited as a reason. What a pity that the said order had, for the better part, evoked indifference and in many cases downright indignation amongst the public which should have instead felt a sense of relief at this long overdue measure. Nothing could serve to highlight the degree of decay of our moral standards than the clamour that has been witnessed from several quarters against the advisability of this measure that was meant to put paid to this mindless orgy. Anybody with a clear head would have grabbed this opportunity as a godsend, if only because he would have reason not to be compelled to resort to what are invariably the most questionable means to display his pecuniary muscle and social status. Agreed that the Govt. order under reference was seen to be wanting in other important respects aw well, inasmuch as the said order had failed to address the concomitant issues accompanying such festivities involving, for instance, the exchange of expensive jewelry as dowry, dress materials, oodles of dry fruit and sundry other items As if all that is not enough, you have the added burden of having to arrange the *phirsal* and *satim*(marking the return of bride to her parental home) after seven days following the main wedding ceremony, which the said order had failed to address among other things. The bottom line is that such measures would not achieve much unless the public realized the futility of these practices and bade them good bye. Notwithstanding the fact that the government had woken up to this reality rather late in the day, there certainly were no great reasons for the public to press for abeyance or rolling back of this order. On the other hand, the fact that the Govt. prevaricated and eventually capitulated to the public pressure amounts to its dereliction of duty and a lack of will in the matter which has dented its resolve to set the things right and take on those who have a vested interest in perpetuating this practice that is clearly primitive, uncivilized and regressive. The rumblings from certain quarters ranging from professional cooks (*wazas*) through tent owners to meat dealers could have been addressed but only if there was sincerity of purpose on the part of those involved in it, one way or the other.

Nothing could be more distressing than the fact that there is no dearth of people in our midst who would not mind greasing the palms of the local administration for favour of looking the other way while being allowed indulgence in these despicable acts of farce and showmanship. It may not be out of place to mention that upon a closer scrutiny, one doesn't fail to witness that a great majority of those hosting a jamboree of this scale are those who have amassed a huge fortune mainly through illegal and illegitimate means. This sets an obnoxious precedent for those lacking the resources for staging such a razzmatazz, and who are thus motivated to go out of their way to marshal the necessary resources for the purpose, with scant regard for the means to achieve that end. This in turn breads further corruption with the attendant consequences and evil effects on society.

While it may be imperative to celebrate, it is important to desist from lavish revelry which, of late, has assumed startling proportions in this part of the world. It is possible that we may get away with these acts of transgression and continue partaking of the bounties of nature, but it is certain that we will end up sowing wild oats for the posterity which will have to pay a heavy price for what will surely be looked upon as our over-indulgent and hedonistic ways of life. The moral implications, the health hazards and the pernicious effects on environment that flow from this extravaganza are too many to risk any longer. It is time we exercised restraint and stopped this sinister practice before we start to live and live with dignity and honor. Any further delay on our part to realize the grave implications inherent in continuing in these socially and morally abhorrent practices is sure to spell doom to the beleaguered people of this State, who are already suffering on countless other fronts primarily because they have refused to see light and to mend their ways for the better.

FISH DIVERSITY IN JAMMU & KASHMIR AND CONSERVATION MEASURES

By: Masood H.Balkhi

Jammu & Kashmir is rich in aquatic resources ranging from roadside ditches, ponds, pools, water-flows, fountains, wetlands, springs, rivers to the voluminous lakes in the plains and the high-altitudes. These waterbodies play a great role in the socio-economic status of the people and produce a variety of flora and fauna. The ichthyofauna of Kashmir is appreciably different from rest of the country and is mainly represented by the coldwater Schizothoracine group. About forty species of fish have been reported from Kashmir, majority of which belong to the genus *Schizothorax.* The present research workers believe presence of only 21 species from Kashmir. About one hundred species of fish are recorded from Jammu waters. The validity of many of these species needs to be ascertained, as there exists a lot of confusion in the present status of the exact fish diversity of the whole state. Therefore, fresh studies are warranted to update the present status of ichthoyofauna in the state in general and Kashmir in particular. The *Barilius* species and the golden Mahseer dominate the fish catch composition in Jammu while in Kashmir the catches are dominated by the common carp in the lacustrine waters and the snow-trouts in the riverine waters. It is observed that some of the *Schizothorax* fish species have almost disappeared from the scenario. A few species have either been synonymised or renamed by some recent workers. The population of Schizothoracine fish has drastically decreased over the years either due to the introduction of exotics or the anthropogenic pressures. *Schizothoraichthys esocinus* that was reported abundantly in Dal Lake is poorly represented in the lake. Similarly almost all

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Masood H. Balkhi is presently working as Dean Fisheries species of schizothoracid fishes have been wiped off from Khushhalsar Lake & Brarinambal Basin of Dal Lake due to organic pollution. Among other things, breeding grounds of the fish have been destroyed over the years especially by filling large areas of waters. In order to save the fish biodiversity of the state especially the schizothoracine fish from further deterioration, immediate conservation measures need to be undertaken which may include check on pollution, abstinence from destruction of breeding grounds of fish and development of hatcheries for mass seed production of trouts, snowtrouts, mahseer and ban on introduction of exotics without detailed study of their impact on the local fishery.

Among the inland fisheries research in the country, the coldwater fisheries research is only three decades old. Jammu & Kashmir (33.34^{oN} ^{c}- 34.34^{c} N latitude and 75.13^{oE-}76.11°E longitude) is blessed with innumerable coldwater resources and has a tremendous potential for the development of fisheries. The State exhibits a great diversity in its geoclimatic conditions. The ladakh region lies in the upper Himalaya in its northernmost part and exhibits cold arid climate. The Jammu region extends from Shivalik plains to the high-altitudes with climate ranging from temperate (Kishtwar, Bhaderwah, Banihal) to the (sub-) tropical conditions. The valley of Kashmir is situated in the midst of western Himalaya at an average height of 6000 ft.a.s.1 and exhibits temperate climate. The Coldwaters of Kashmir are generally located at 1500 m and above m.s.l. Most of the fishes are small-sized showing a distribution pattern that depends on rate of flow of water, nature of substrata and availability of food. Some species have developed special organs of attachment to enable them to live in fast turbulent streams as is common with fishes of such waters.

The important river systems in the State include the Indus River System (Ladakh), the Jhelum River system (Kashmir) and the Chenab River system (including the Tawi,Ravi and Rajouri Tawi systems in Jammu).

The state of Jammu & Kashmir can also be divided into three regions with respect to fishes which is our main concern here:

1) *Fishes of the Kashmir valley* with many fishes of Central Asia and endemic species;

2) *Fishes of Kashmir Province* consisting of outlying areas of Kashmir region including Gulmarg, Baramulla, Lolab valley, Pahalgam, Sonamarg upto Kishanganga-Sindh valley and the Ladakh area within Central Asian Ichthyofauna and

3) *Fishes of Jammu Province* including Poonch,Kathua,Bhaderwah and Kishtwar with fishes mostly of Indian origin. The origin of Jammu Province fishes is from the Indo-Gangetic region (Das & Subla, 1963).

Among the lakes of Kashmir, the important ones are Dal (1100 ha), Manasbal (280 ha), Wular (2400 ha), Anchar (700 ha), Khushalsar (70 ha), Malpursar (1.6 ha) situated at 1584m a.s.1. while Nilnag (25 ha), Alapathar (8 ha), Marsar (8.5 ha) Tarsar (5.0 ha), Kishansar (40 ha), Gangabal(175.0 ha) Kousernag (140.0 ha), Seshanag (51.0 ha) are all high-altitudes being situated above 2000 m a.s.1. The high-altitude lakes are generally oligotrophic to ultra-oligatorophic in nature. Eutrophic lakes (most of the lower altitude lakes) produce a variety of fish dominated by the common carp (*Cyprinus carpio).* The important wetlands in the valley include Hokarsar, Shalabugh (in the district of Srinagar), Mirgund and Hygam (in the district of Baramulla) and these constitute ideal homes for the migratory birds. These wetlands are dominated by the common carp and may turn eventually dry if measures to save them are not enforced well in time. Among the lotic habitats, river Jhelum occupies an important place in the valley followed by the trout streams. The major fishery of the river is constituted by the Schizothoracids (an endemic group of *Schizothorax* spp). Fishes like *Glyptothorax* spp. *Glyptosternon* spp., *Nemacheilus* (*=Triplophysa*) spp., and salmonids (*salmo* spp) prefer the clean flowing waters of snowfed and springfed streams like Lidder, Bringhi, Erin, Boniyar, Kishanganga, Sindh etc. Trout is the most prized fish of these waters and constitute an important resource in Kashmir both from sport and aquaculture angle. The State has more than 27 trout hatcheries located at different places. Each year lakhs of trout fingerlings are produced in these hatcheries/farms and stocked in the hill streams. A hatchery was built at Achabal in 1908 from where eyed ova were distributed to all over Kashmir and were even sent to parts of India like Kulu, Simla, Shillong etc. Important trout hatcheries in Kashmir include Laribal, Acchabal & Kokarnag –the latter acting as *mother seed farm* for trout fry & fingerlings. Rainbow trouts are best suited for culture practices because they are easily domesticated and adapt to the environmental conditions without much strain than the brown trout. Further, rainbow trouts easily take to artificial feeding, can withstand higher temperature & reduced oxygen and are also resistant to certain diseases. Their incubation period is short and development is rapid as compared to the brown trout. Thus there is great need to study the breeding and feeding behavior of the Brown trout with evolving artificial feed to bring it to the desired level of farming and subsequent stocking in the natural resources.

The fish fauna of the valley is quite different from rest of the country and is dominated by the schizothoracine group. Although a number of researchers have worked on the taxonomy of this group of fishes, still the validity of different species has not been resolved and a lot of confusion prevails about the identification of different species.

Fish fauna studies in Kashmir were initiated by Heckel (1838). During this study, he reported sixteen species of fish that were all new to science and published them in his book "*Fishe aus caschmir*". Later on workers like McClelland (1839), Heckel (1844), Misra (1949), Malik & Khajuria (1955), Silas (1960), Sunder & Subla (1960), Das & Subla (1963-64), Malik (1966), Yousuf (1989,1996,2000), Balkhi (1995), Wanganeo et al (2003) also reported on the Ichthyofauna of Kashmir in different habitats.

About forty species of fish are reported from Kashmir (Table 1) excluding the grass carp & the silver carp that are maintained in the pond ecosystems only. More recently, Kullander et al, (1999) have revised fishes of Kashmir from river Jhelum and a few surrounding habitats. The authors have synonymised/ renamed some species of *Schizothorax* and opened new challenges for updating the fish species of valley. They recorded 20 valid fish species and reported *Tor putitora* as extirpated from Kashmir. However, Balkhi (2004) recovered specimens of *Tor putitora* from the unexplored areas between Parampilla and Red bridge in Uri sector in Kashmir thus negating reports of its exptirpation. With this, the number of valid fish species in Kashmir rise to twenty-one (Table 1, #). Regarding exact status of fish fauna, a lot of confusion exists and fresh detailed studies are warranted on the actual number of fish species that is also of great significance in fishery management.

Common carp and the Schizothoracids (especially *S. esocinus*, *S. niger*, *S. plagiostomus*) constitute the important fisheries of the valley. The common carp in the lacustrine waters constitutes more than 50% of the fish catch while *Schizothorax* species form a major catch in the riverine waters. Among the endemic fish species, B*angana diplostoma* ("Roput" in Kashmiri), *Schizothorax esocinus* ("Churoo" in Kashmiri), *Schizothorax niger* ("Ale gad"), S.curvifrons ("Satter gad"), *Crossocheilus diplochilus*("Tethur") have commercial importance with wider distribution in clean waters.

The important lakes in Jammu include Kailash, Sanasar, Malisar, Bhadnaz, Talva or Sharoth or Dhudhari Lake, Hadri-Kabansar, Mansar, Suransar etc. The Ichthyofauna of Jammu had not been adequately investigated until Das and Nath (1965,1966) who reported on the fishes of Jammu including Poonch.Subsequent investigations were conducted in Samba, Doda, Kathua, Udhampore, Rajouri, Poonch and Chenab/Tawi rivers by Das & Nath (1971), Malhotra et al (1975), Malhotra & Dutta (1976), Dutta & Malhotra (1984), Dutta & Kour (1999); Dutta et al (2001); Dutta & Fayaz (2003). Das & Nath (1971) reported twenty-three species of fish from Jammu. Jyoti et al, 2004 report sixty-three species of fish from Jammu including the five exotic species. There are about one hundred fish species reported from Jammu (Table 2). However, the validity of many species needs to be ascertained and fresh taxonomic studies are warranted to remove all confusions in the present status of the fish diversity. During a recent study of the Tawi & Chenab rivers in Jammu (Balkhi, 2004), twelve valid species of fish were recorded with catch composition dominated by the *Barilius* species and the Golden Masheer as compared to any other fish species. During this four years study, the author did not record a single specimen of *Tor khudree* reported in Jyoti et al (2004) and it was a common observation to catch small specimens of the golden Mahseer weighing hardly up to 500 gm probably due to great pressure of fishing in the available waters in Jammu & Kashmir. The River systems of Jhelum (Kashmir) & Chenab (including Tawi, Jammu) have remained subjected to intensive exploitation with the result remunerative capture fisheries of past years no longer exists. The capture fishery of the prized Mahseer and the snow trouts in these rivers has registered a drastic decline in number and size as a result of indiscriminate catching of brood stock & juveniles. Therefore, strict measures need to taken by the Government functionaries to ensure fishing in proper seasons by using nets of desirable mesh size.

Besides the fishing pressure, there are other natural and anthropogenic pressures that have contributed to decline in fish stocks. They are habitat destruction due to over abstraction of water, construction of dames and barrages, siltation, and pollution due to urban, industrial and agricultural run-off.

As a consequence of dam construction and other obstructions in rivers, disruptions of the reproductive cycle of the migrant species (e.g. Mahseer) and alterations in the breeding grounds of other resident species (Schizothoracids) have been widely reported.The construction of Salal Hydroelectric power project on River Chenab in Jammu and the Mangla dam in POK/Uri Hydroelectric power projects in Kashmir have proved highly detrimental for the migratory Mahseer and the snow-trouts respectively. The Mahseer fish does not make it from Muzaffarabad in POK to come to up to the Jhelum in Kashmir due to absence of a proper fish-pass (Ladder) in the barrage.The specimens recovered during the recent study by the author from Uri Jhelum could be the old stock that has learnt to survive in the stretch of water between Line of control and Parampilla in Uri Kashmir. The temperature of the area in question is dry temperate. Similarly the Mahseer in Chenab cannot migrate beyond Reasi where the Salal project/barrage has come up without providing a fish-pass (Ladder) in it. The fish-pass (Ladder) provided in the Uri barrage is not efficient enough to allow all fish to migrate upstream. Therefore, in order to conserve the fishery of the rivers, it is firstly essential to provide proper fish-passes (Ladders) in the Power projects so that the migratory route of the fishes is not cut off which has a detrimental impact on their breeding and subsequent population dynamics.

Introduction of exotic species have become a common practice. Although some introductions have been successful and have augmented fish production in the country, others have shown a strong negative impact on native population. The population of Schizothoracine fishes in the valley has considerably decreased over the years particularly after the introduction of common carp in 1956. The fish has not only flourished well in the aquatic habitats of the valley but also provides the maximum overall fish catch (about 70% of total fish catch). However, common carp has proved to be a continuous threat to the prized local species of Schizothorax whose population has considerably decreased during the past. This is, in particular due to the deterioration of the habitat caused by the feeding habitats of the common carp together with its high fecundity. *Gambusia affinis* is believed to have been introduced accidentally some sixty years back. The fish is not commercially important but has got well established in Kashmir waters. There is also no definite record about the introduction of *Carassius carassius* in Kashmir waters. However, the fish forms a good catch in certain valley lakes and has also gained commercial importance. **Grass carp** and **Silver carp** have been introduced in Kashmir under pond conditions about a decade back by the Development Department. These two fishes are still under observation in captivity and have not been released in any of the open water of Kashmir. Recently there has been much debate about the possibilities of biological control measures to cope up with the weed problem in the lakes. The overall ecological balance has to be kept in mind before any decision in this direction is taken. The ecology and behaviour of the grass carp in relation to the local fauna and flora has to be studied in detail in some closed system. The closed system is very essential as otherwise the fish may be accidentally released into other waterbodies which can have far reaching consequences as almost all the major aquatic habitats of the valley are interconnected

The other principal factor that has possibly contributed to the decline in endemic fishery includes the rapidly changing ecological scenario in the aquatic habitats. All the waterbodies situated in close vicinity of human settlements have been receiving large quantities of untreated sewage that has affected the water quality. This has greatly harmed the local fish fauna that are adapted to live in relatively clean waters. Fishes of almost all kinds (schizothoracids) have been wiped out from Khushhalsar Lake and Brari nambal areas of Dal Lake due to organic pollution. Measures need to taken to ensure that no domestic/ industrial effluents are allowed to be released into the open waters.

Another factor responsible for the decline in the schizothoracine population is the encroachment of the shallow peripheral areas of the lakes. This has been particularly responsible for the decrease in the population of *Schizothorax niger* (Locally called Ale gaad). This fish breeds in the shallow areas of the lake particularly in sandy areas with springs oozing from bottom. Since large areas of lakes Dal, Anchar, Wular etc. have been filled up, the breeding grounds of the fish have greatly shrunk and this has led to the decrease in population/production of fish. Therefore, in order to stop further devastation to the breeding grounds of the fish, it should be ensured that no encroachments are allowed in the peripheries of the waters bodies.

Fluctuating water level in tributaries of some lakes and streams have also a great bearing on the fish populations. Most of the Schizothoracine fish breed in the upper reaches of the connecting streams especially in areas with sandy and gravelly bottom. The breeding season of *Schizothorax* spp in Kashmir starts in March and continues upto June in different species. During this period, the streams are generally full of water and as such the fish move as far upwards as possible and spawn in shallow areas of the streams. However, soon after the eggs hatch out and the larval stage is reached, the quantity of water in the streams decreases thus resulting into formation of side-pools wherein large number of the fish fry get trapped and ultimately perish due to drying up of these side-pockets just before these reach to the feeding ground in the lower reaches of the streams and into the lakes. This is especially true of Telbal and Sindh nallas where larvae of *Schizothorax esocinus* get trapped and perished. Government machinery needs to be geared up to rescue such trapped population for safe release into the open waters.

In view of the above stresses affecting many fish communities, there is an urgent need for conservation of fish genetic resources of the State. Intensive efforts are needed for identification of populations of exploited or endangered species (mostly the schizothoracids) and for monitoring of genetic variability of fish populations.

TABLE 1. THE ICHTHYOFAUNA OF KASHMIR

ORDER: CYPRINIFORMES

Family: Cyprinidae

Sub-family: Cyprininae

1. Cyprinus carpio Linnaeus-Introduced#
   C.c.communis
   C.c.specularis
   *C.c.nudus
2. Carassius carassius(Linn.)- Introduced#
3. *Labeo dero (Heckel)
4. *L.diocheilus (McClelland)
5. Bangana diplostoma(Heckel) #
6. Puntius conchonius (Hamilton)- Introduced#
7. **Tor putitora (Hamilton)-Migratory

Sub-family: Schizothoracinae

8. Schizothorax curvifrons Heckel#
9. S.esocinus Heckel#
   S.montanus from Ladakh
10. S.huegelii Heckel
11. S.lingipinnis Heckel
12. S.micropogon Heckel
13. S.nasus Heckel
14. S.niger Heckel#
15. S.labiatus (McClelland & Griffith) #
    (=S.ladacensis from Lakakh)
16. S.planifrons Heckel
17. *S.progastus Heckel
18. *S.punctatus Heckel
19. S. plagiostomus Heckel#
    (=O.plagiostomus=S.skardensis from Lakakh)

ORDER: SILURIFORMES

Family: Cobitidae

Sub-family:Botinae

24. Botia birdi Chaudhuri#

Sub-family:Nemachilinae

26. *Nemachilus gracilis Day
27. *N.vitatus Heckle
28. N.kashmirensis Hora
    [=Triplophysa kashmirensis (Hora)] #
29. N.marmoratus Heckel
    [=Triplophysa marmorata (Heckel)] #
30. *N.rupicola McClelland
31. *N.yasinensis Alcock
32. *N.stoliczki Steind.
33. Schistura punjabensis (Hora) #

Family: Sisoridae

34. Glyptothorax kashmirensis Hora#
35. G.pectinopterus McClelland& Griffith#
36. Exostoma stoliczki Day
    =Glyptosternon reticulatum McCle. & Griffith#

Family:Siluridae

37. *Ompok bimaculatus (Bloch)

ORDER: CYPRINIDONTIFORMES

Family: Poecilidae

38. Gambusia affinis (Baird & Girard)-Introduced
    (=G.holbrooki Girard)#

20. *O.sinuatus (Heckel)
21. *Ptychobarbus conirostris Steind.
22. Diptychus maculates Steind.
23. *Schizopygopsis stoliczkae Steind.

Sub-family: Garrinae

24. *Gara gotyla (Gray)
25. Crossocheilus diplochilus Heckel#

ORDER: SALMONIFORMES

Family: Salmonidae

39. Salmo trutta Linnaeus- Introduced#
40. Salmo gairdneri Richardson- Introduced [=Oncorhynchus mykiss(Walbaum)] #

**Uncertain validity; **species recovered from Uri, Kashmir (Balkhi, 2004);*
# Valid species from Kashmir (Kullander et al, 1999) including T.putitora (Balkhi, 2004)

Table 2: ICHTHYOFAUNA OF JAMMU.

ORDER: CYPRINIFORMES

Family: Balitoridae

1. Acanthocohitis botia (Ham.Buch)

Family: Cobitidae

2. Botia dayi (Ham.)
3. Lepidocephalus guntea (Ham. Buch)
4. Nemacheilus botia (Ham.)
5. N.prashadi Hora
6. N.punjabensis Hora
7. N.stoliczkae (Steind.)*

Family: Cyprinidae

8. Amblypharyngodon gadigarhi
9. Aspidoparia morar (Ham.)
10. Barbus hexagonolepis McClelland*
11. B.wynaadensis Day*
12. Barilius bendelesis (Ham.)+
13. B.vagra (Ham.)+
14. Catla catla (Ham. & Buch)-Exotic

38. L.pangusia (Ham.)
39. L.rohita (Ham. Buch)
40. Oreinus plagiostomus (Heckel)
41. Osteobrama cotio (Ham)
42. Oxygaster bacaila (Ham.)
43. Puntius chrysopterus (McClelland)*
44. P. conchonius (Ham.)
45. P.chola (Ham. Buch)
46. P.sarana (Ham.)
47. P.sophore (Ham.)
48. P.stigma (Ham.)*
49. P.ticto (Ham)
50. Rasbora daniconius (Ham.)*
51. R.rasbora (Ham.)
52. Salmostoma bacalia (Ham. Buch)
53. S. punjabensis (Ham. Buch)
54. Schizothorax esocinus (Heckel)
55. S.curvifrons (Heckel)

15. Chela atpar laubuca (Ham.)*
16. C.cachius (Ham. & Buch)
17. C. laubuca Ham.)
18. Cirrhinus mrigala (Ham.Buch) -Exotic
19. Cirrhinus reba (Ham.)
20. Crossocheilus latius diplochilus (Heckel)
21. Ctenopharyngodon idella ((Valenciennes)- Exotic
22. Cyprinus carpio communis Linn. –Exotic
    C.c.specularis Linn. -Exotic
23. Danio devario (Ham.)
24. D.rerio (Ham.)
25. Esomus danricus (Ham.)
26. Garra gotylas gotyla (Gray)
27. G.lamta (Ham.)
28. G.mullya (Sykes)*
29. G.variabilis (Heckel)*
30. Hypophthalmichthys molitrix (Valeniennes)
31. Labeo bata (Ham.)
32. L.boggut (Sykes)*
33. L. calcasu (Ham. Buch)
34. L.dero (Ham.)
35. L.diplostomus
36. L.gonius (Ham.Buch)
37. L.microphthalmus (Beavan)*

ORDER: BELONIFORMES

Family: Belonidae

72. Xenontodon cancila (Ham.Buch)

56. S. progastus (McClelland)
57. S.richardsoni (Heckel)
58. Tor khudree (Sykes)*
59. T.putitora**
60. T.tor
61. Triplophysa yasinensis (Alcock)

ORDER: PERCIFORMES

Family: Gobidae

62. Glossogobius giuris (Ham)

Family:Osphronemidae

63. Trichogaster fasciatus (Bloch & Schn.)

Family: Nandidae

64. Badis badis(Ham.Buch)

65.Nandus nandus (Ham.Buch)

Family:Channidae

66. Channa gachua (Ham)*
67. C.marulius (Ham.Buch.)
68. C.orientalis (Bloch. &Schn.)
69. C.punctatus Bloch
70. C.striatus Bloch

Family: Belontidae

71. Colisa fasciatus (Schn.)

86. G.pectinopterus (McClelland)
87. G.punjabensis (Mirza & Kashmiri)
88. G.telchitta telchitta (Ham. & Buch)

ORDER: SYNBRACHIFORMES

Family:Mastacembelidae

73. Macrognathus jammuensis
74. Mastocembelus armatus (Lacepede)
75. M.pancalus

ORDER: SALMONIFORMES

Family: Salmonidae

76. Salmo gairdneri gairdneri (Richardson)
77. S.trutta fario (Linnaeus)

ORDER:OSTEOGLOSSIFORMES

Family: Notopteridae

78. Notopterus notopterus (Pallas)

ORDER: SILURIFORMES

Family: Sisoridae

79. Amblyceps mangois (Ham.Buch)
80. Bagarius bagarius (Ham.Buch)
81. Gagata cenia (Ham.Buch)
82. Glyptothorax botium (Ham. & Buch)*
83. G.cavia (Ham & Buch)*
84. G.garhwali Tilak
85. G.kashmerenses Hora
89. Glyptosternon reticulatum McClelland

Family: Bagridae

90. Mystus bleekeri (Day)
91. M.cavassius (Ham.Buch)
92. M.seenghala (Sykes)
93. M.vittatus (Bl)
94. Rita rita (Ham & Buch)

Family: Schilbeidae

95. Clupisoma garua (Ham.Buch.)
96 .Eutropiichthys vacha (Ham.Buch)
97. Pseeutropiusud atherinoides (Bloch)
98. Heteropneustes fossilis (Bloch)

Family: Siluridae

99. Ompok bimaculatus (Bloch)
100. Wallago attu (Schneider)

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* Validity uncertain

+ Constituted dominant catches in River Tawi and its tributaries

** Constituted dominant catches in Tawi and Chenab River systems

TRAFFIC PROBLEMS IN KASHMIR

By: R.A. Patloo

In the modern world the pulse of any city can be gauged by the way traffic plies on the roads. The discipline and organization of traffic reflects the behavior, level of tolerance, the competence of the civil administration and the level of civilization of the inhabitants of that city.

Thousands of vehicle play on Srinagar roads daily, the Govt. is not making any efforts to improve transport system. The road network in Kashmir valley has not been expanded and upgraded which has become the main cause of road accidents and traffic jams with the result the people in the stat of J&K are facing lot of hardships because of traffic situation. The traffic control department should introduce modern gadgets to regulate and control traffic. There are also no devices available within the traffic department to check speed of the vehicles. In the state of J&K the road communications system is far behind as compared to other states of India. Roads in the sate of Jammu & Kashmir should be widened to accommodate heavy flow of vehicles. It is pertinent to mention here that traffic department should install high end technology to regulate traffic so that people can have a sigh of relief. Drivers in particular and people in general should realize their duties towards society, better road communications system leads to industrial development. We have to be at par with the rest of the world as far as road communication system is concerned, so that there will be development in every sphere of life. Some roads have remained the same what they where decades back and it most unfortunate there are no subway existing in the city. Engineers should also play their roles for better road system, they have failed to develop city roads to accommodate heavy pressure of moving vehicles. It is pertinent to mention here that the current Srinagar master plan points out that the present system of transportation is inadequate and in order to minimize the traffic intensity on M.A. Road and its junctions the plan recommends shifting of major Govt., commercial and transport terminals.

The increasing number of vehicles day by day is the major cause of traffic jam and accidents one narrow roads it is suggested that Govt. should separate the pedestrian and automobiles traffic by way of subways, and side walks. The state government should construct alternative routes to reduce the traffic intensity so that there will be efficient transportation system in the state of Jammu & Kashmir, one should try to.find out an average maximum number of cars passing a point in a given amount of time and on the other hand we should see whether our roads are in a position to accommodate such number of cars in a particular time. The state government should solve the traffic problem. At the same time traffic department should educate the people about the traffic rules. Looking at the traffic situations of some of the major roads in Srinagar city the government should take the concrete steps to solve the traffic problems as we supposedly have one of the most volatile traffic scenario in the state. Government should take steps that no inconvience is caused to the people and there is need for the cooperation from the transporters for providing better facilities to the commuters people should realize that if they develop patience and refuse to travel in those buses which are crowded. Transporters will be left with no other option other than improving their services.

The conditions of roads in Kashmir had remained un changed since the past 30 years. Govt., should upgraded roads and widened to accommodate a huge flow of traffic.

There is considerable increase in the number of vehicles over the years has resulted in frequent traffic snarls in the valley of Kashmir. There should be special squads to check violation of any traffic norms to minimize road accidents in the Kashmir valley.

The department has been organizing traffic weeks over the years which supposedly aims at bringing the awareness among the public regarding the traffic rules but the week has become a sort of ritual and has failed to serve its purpose the department should devise innovative ways of the familiarizing the people about the traffic rules. Academic curriculum is one of the way of reaching out to that segment of population which in future would be driving vehicles on the roads. Seminars, quiz programmes, mass circulations of rules among the people is one way of attaining the objective.

HISTORY OF FRUIT CULTIVATION IN JAMMU AND KASHMIR STATE- CONSTRAINTS AND STRATEGIES

By: K. D. Farooqui

The apple has been a part of man's diet throughout Asia and Europe for centuries, being known to the Greeks and Romans and mentioned by Theophrastus in the third century B.C. Since then it has been spread by man into almost all parts of the world. This has been possible because of the great amount of genetic variability found in the apple which has allowed adapted types to be selected for different environments. The implicit assumption has always been, that it was the apple with which eve tempted Adam.

The cultivated apple usually referred to as *Malus domestica* Borkh is considered to be the parent of most of our cultivated apples and is endemic in the area from the Balkans and southeastern Russia, Iran, Turkistan, and North to the Altai Mountains in central Russia. Almost certainly *M sylvestris,* which is distributed over much of Europe and into western Turkistan, was involved in the early development of the apple as was M. *baccata* from eastern Asia including eastern Siberia, Magnolia, China, Japan and the Himalayas (Brown, 1966). The centre of origin of apple is the Southwestern Asia in the Caucasus area near Gilan in Turkistan (Vavilov, 1951). The greater part of world production is o_ dessert and cooking apples although the dual purpose apple is gaining in importance. The high fruit quality now being demanded makes it necessary to have an outlet for the lower quality fruit, and this means they must be suitable for processing in various ways or for the production of apple juice.

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The Jammu and Kashmir state is located in the northern most part of India between 32° - 17' to 37° - 06' latitude, 73° - 26' and 80° - 38' East longitude and 81 ° east Greenwich falling in western Himalayan region of the country. The Geographical area of 233 lakh square km comprises mainly of mountainous tract out of which an area of 24 lakh hectare encompass agriculture.

The very specific agro-climatic conditions in which the J and K State is placed offers tremendous opportunities and potential for the development of both temperate and sub-tropical fruits. The valley of Kashmir has distinction and comparable to any other state in the country, producing all kinds of temperate fruits. The favourable agro-climatic conditions and the active involvement of the people in fruit farming has been responsible in the increased production of fruits since independence. Nearly 2 million people of the state are directly or indirectly involved with the fruit industry and the annual turnover of fruit industry in the state is around 2000 crores.

Apple cultivation in Kashmir-Historic back drop

In Jammu and Kashmir state apples have been grown since very early times. History reveals that apples were being cultivated in the state even in 2000 B.C, during the reign of Nara. Its cultivation got extended during the reigns of Laltaditya (1089 A.D.). The cultivation is however, presumed to have been indigenous varieties grown for the purpose of local consumption only (Bamzai,1987). Emperor Jahangir in his book **"Tozld Jahangir"** praises the Kashmir apple as "the apples of Kashmir are known for their goodness, excellent taste and flavour" (Lawrence, 1889). The earliest exotic apple plantations must have been established in Kashmir by the turn of the 16th century (Kanwar, 1987).

With its continental climate, Kashmir has been the home of large varieties of sweet fruits. Ancient records of *Rajatarangi* and *Alberuni* mention the existence of numerous varieties of fruits in Kashmir. Later, Afghans, Sikhs and Kashmiris paid very little attention to cultivation of fruit, with the result that these went wild in a: few years. Duke (1876) , mentions "fruit trees of all kinds were growing all over the valley, which were wild but bearing fruit. Thousands of acres skirting the foot of the hills were covered with apple in full bearing.

Apples ripened in the valley early in September and were garnered about the middle of that month.

Nature was so bountiful that a large proportion of the crop fell to the ground, and was either eaten by the cattle or dried in the season, to be eaten boiled during the winter. What remained was collected early in September. The men climbed the trees and shook the branches; the fruit which fell to the ground was then gathered into heaps, a day or two in the season until it reached maturity. The fruit was then cut into halves or quarters, and the pieces threaded on long strings, which were hung to the rafters of the dwellings. If, however, the fruit was large, it was consigned to capacious kiltas or baskets. In that case great care had to be taken that the fruit was thoroughly dried before it was put away, otherwise fermentation ensued and it decayed. Carefully dried apples could be preserved for a year. The variety of apple known as *"Ambri tsunt"* was the most esteemed, for eating and preserving" (Husband, 1970).

Dried apples were called *"tsunt het"* and formed an important article of food in Kashmir during the winter. As it was considered a heating diet it was always eaten at the morning meal; and, for the same reason, whatever remained on the disappearance of the winter snow and the advent of spring, was given to the cattle.

The different varieties of apples most commonly produced were *"Ambri tsunt", "Ser tref" "Ts 'uk tsunt", "Tetshukur"* and *"Baflpuri".*

Improvement of apple in Kashmir

For improving the indigenous fruits of Kashmir and introducing European varieties, credit goes entirely to French experts. The fact that there were possibilities of turning Kashmir into an orchard producing different kinds of delicate fruits was noted by all the European travelers from Bernier to Vigne, is interesting. M. Ermens, formerly head Gardner of public works in Paris came to Kashmir and made a through investigation of the soil, climate, rainfall and other conditions prevailing in the state during 1865. He submitted a report for importing varieties of grape and apple into Kashmir valley. Being a gardener by profession, Ermens brought with himself considerable number of fruit plants which he believed would thrive in Kashmir together with implements for starting an experimental agricultural farm. These fruit trees were planted in *Chashma-Shahi* in 1875. In May 1889, Sir Edward-Buck, submitted a scheme for improvement of fruit culture in Kashmir to government of India after realizing the abundant scope for the production of high class fruit of European type. The success of the scheme would depend on European supervision. Later on, Mr. Gollan, an experienced French Gardner whose services were lent of 3 months had seen a great deal and made him-self very useful. With the help of the Governor of the valley Mr. Gollan, collected during the winter months about 25000 wild fruit stocks mostly comprising crab apple and edible crab and this was the beginning of establishment of a nursery which proved of incalculable benefit to the state. Plants were subsequently distributed to the state orchards. The state established a department of Agriculture and Horticulture in 1907 and from 1908 a member from Kashmir sat on the board of Agriculture of the government of India (Source: Gazetteer of Kashmir and Ladakh, 1974. *Vivek Publishing House, Delhi)*..

History of research on apple in Kashmir on scientific lines

Research on apple and other temperate fruits on scientific lines commenced during 1945-46. The survey of apple was conducted during 1951-52 which revealed existence of 113 varieties of apple both exotic (European) and indigenous (Anon. 1972 & 1974). Among the indigenous varieties *Doodh-Ambri, Chari-Ambri, Mah-Ambri, Khatoon-trel, Kamraz-trel, Panz-trel, Khiram-trel, Chamur,* ***Maharaji*** **and** ***Malmoh*** were more common in the orchards of the valley. During 1962 the government of Jammu & Kashmir established a separate department of Horticulture which therefore, gave a Philip to the research activities on temperate fruits particularly apple. Several apple varieties were introduced in the valley from different temperate fruit growing countries of the world namely USA, UK, France, Russia, Australia, Israel, Canada, Italy and Germany. This way a sizeable collection of apple varieties was made and a repository of apple germplasm was established at Shalimar Research Station. Evaluation studies on these introductions have been made since long and the results thus arrived stand documented and published (Farooqui, 1978). At present there are over 350 varieties of apple in these collections.

Fruit growers, researchers and students have greatly been benefited by this repository. During 1974-75 two newly evolved varieties *"LALAMBRF'* and *"SUNHARF'* were released by the Research Station Shalimar for mass cultivation in the state. These varieties are the result of hybridization and genetic manipulation between indigenous Ambri and exotic delicious group of apples. Better yield potential and quality of these newly evolved varieties have made them popular among the fruit growers of the state (Farooqui, et al., 1986) These varieties have been rated as the best quality apples in all India apple show competition.

The dreaded fungal disease scab (Venturi a inaequalis) appeared in an epidemic form in this state during 1973-74, Ambri which is known for its excellent flavour, taste, colour and keeping quality was a serious victim of this fungal disease. As a result fruit growers, started heaving down Ambri orchards and replaced them by exotic delicious group of apple varieties. Having realized the magnitude of damage caused by scab to the apple orchards, scab resistant varieties from scientifically advanced countries were introduced in the valley, these were evaluated and used as parents imparting resistance to scab disease in Ambri and other commercially important cultivars of apple. In 1993-94 Sher-e-Kashmir University of Agricultural Sciences and Technology released two scab resistant apple varieties namely "FIRDOUS" and "SHIRE EN" for mass cultivation. These varieties find favour among fruit growers. During 2000 a high quality and high yielding apple variety *'AKBAR'* and another scab resistant apple variety *'Gulshan'* were released by Sher-e-Kashmir University of Agriculture Sciences and Technology Shalimar for mass adoption.

2. Fruit kinds grown in the state

Apple orchards account for nearly 70 per cent of the total fruit area and therefore is by far the most important fruit crop. There are some basic reasons for apple being more popular with the fruit farmers of the state. Except H. P. and some small areas in Uttaranchal, J&K state is the only place where apples are grown in the country. Even 'the present production of apple in the state hardly contributes one apple per capita per year to the country's population. There is thus a huge market for thi.., fruit in the country. Compared to soft fruits, apple can stand transit to marketing centers better and can be stored for relatively larger periods of time. Compared to walnuts and almonds which are traditionally grown on seedling trees, apple trees being vegetative propagated are true to type and yield fruit in relatively younge:' age and thereby ensure quicker and better returns. Walnut is an important nut crop of the state. The agro-climatic conditions of J&K state in general and Kashmir valley in particular are ideally suited for its culture. The major quantity of walnuts produced in the country is from Kashmir. Kashmir walnuts find place in international markets as well, and nearly 5 crore rupees are earned from this commodity in foreign cxcl'ange. The quantity' of in-shell walnuts marketed outsidc the state in 2003-04 was 9847 tones and 6030 tones ofkernels. Almond cultivation has its importance because of 'he fact that country's production is not sufficient to meet its demand and thereby any increased production is the saving of foreign exchange. Kashmir is the most ideally suited place in the country to grow this nut crop.

3. Production and distribution of plant material

Introduction of exotic varieties of various fruit khds was initiated as far back as the reign of *Zain-ul-Abidin* 0300 ,\.D) (Duke, 1876). who introduced some varieties of fruits from Kabul. The import of European varieties of deciduous fruits for cultivation if, Kashmir W::JS started towards the close of last century. Th_ process of introduction of varieties of proven performani2e has been continuing since then with ever increasing emphasis. The performance of such varieties is' watched under the agro-climatic conditions of the state b,efore its mass propagation ,is taken up. The state department of horticultures has established fruit p1ant nurseries in the length and breadth of the state within the fruit growing zones for the production of fruit plants. In addition several private nurseries have also been established, and plant material in the nurseries is raised under the technical supcrvision of state department of horticulturc. Standard quality fruit trees of different kinds and varieties of known performance and behavior have been selected and marked. These are used as mother trees for the propagation of plant material. The plant material of

various kinds and varieties has be_n planned to be introduced accmding to their suitability in differl_nt agro-climatic zones of the state.

4. Nursery practices

Apple plants are raised on seedling rootstocks. Seed is obtained from commercial varieties especially Maharaji, a vigorous and prolific apple bearing variety. No large scale plantations on clonal rootstocks are seen in the state. Efforts to introduce these are already in hand and small scale trials to evaluate their suitability have been taken up by SKUAST (K), at Shalimar. Ap_le plants of Red Delicious, Royal Delicious, Golden Delicious and Granny Smith varietiq .on EM-2, EM-4, EM- 7 EM-9 and EM-II have been introduced in four specific agro- climatic zones of the state. Under certain agro-climatic conditions Golden Delicious, and Royal Delicious yielded ii:uit even in second year (as against 5-6 year on seedling rootstocks) after plantation as also did Red Delicious and Golden Delicious plants. on M- 7. Two years after plantation Golden Delicious and Granny Smith on M-4 and Royal Delicious on M- 7 started bearing fruit. Encouraging results thus obi-lined prompted for large scale trials but this was restricted because of paucity in the availability of clonal rootstocks. A nucleus collection of some strains of the clonal rootstocks e.g. EM-2, EM-4, EM-7, EM-9, EM-II, EM-l2, EM-13, EM-16, EM-21, EM-25. EM-26, crab, MM-I03, MM- 104, MM-I08, MM-IIO, MM-lll, MM-119, MM-778, MM- 779, MM- 789, MM- 793 and these are under multiplication at Main Campus of SKUAST (K), Shalimar, (Farooqui 1981). Seeds from fully matured apples are extracted in October-November and after being washed and dried in shade, these are sown in December in raised seed beds. Seedlings emerge in April and through December these are nurtured in the nursery beds. Between December to March, the seedlings are uprooted from the nursery beds, graded to eliminate stunted and damaged seedlings and transplanted in nursery beds prepared after digging the soil to 18 inch depth. The same year July 15 the seedlings are shield-budded. In the forth coming fall these are decapitated to remove stock above the bud union. The scion sprouts in April and it is nurtured to a single-whip through

December when the plant i:) ready for upro0ting for permanent plantation in the orchard.

WALNUT;

All old walnut trees are of seedling origin. These trees are giant -sized and their cultural management becomes difficult. This is one of the main reasons why walnuts are grown in singles or utmost in grooves on hills, slopes and waste land with introduction of vegetative propagation by researchers which not only safe guards quality of the nuts and reduces the maiden age of the trees but also is a factor determining the size of the individual trees, regular plantations of walnut are becoming a common sight in the state. Walnut budding has, however, posed its own problems the current practice is to patch-bud walnuts. *J. regia* is used as rootstock. The budding success is poor and most of the budded trees show characteristic bulging at the point of union. Vegetative propagation techniques for walnuts have been standardized by SKUAST (K) and efforts are being made to introduce alternate rootstocks by State Department of horticulture in collaboration with SKUAST(K) Shalimar.

The variability in the seedling raised walnut trees has, however, been responsible to build up a huge germplasm and numerous trees bear walnuts of excellent quality character_. A survey of the existing plantation in the state is in hand with division of Pomology of SKUAST (K), to locate equality walnuts for future propagation. In addition standard varieties of walnut have been introduced from available sources. Based on several years survey and evaluation studies high quality and better yielding walnut genotypes have been identified and released for mass adoption under the names of *Hamdan* and *&daiman* (Bhat, A. R. 2004) ,

ALMONDS:

As in the case of walnuts existing old almond plantations are also of seedling origin. The state department of horticulture and SKUAST (K) have however introduced budded almonds and in fact, vegetative propagation of almonds has already become an established practice. The usl1al rootstock used is bitter almonds. Budding success is excellent. Most *of* the recent plantations are only of budded almonds.

Almond is the earliest blooming fruit tree in the state and is obviously exposed to the damage caused by the possible late frost. Researchers at Shalimar research station have identified and released late blooming and high yielding almond varieties like *Warts, Shalil11ar, MakhdoGI11* and *Parbat,* (Farooqui, 2004). In addition some standard varieties have been introduced by :SKUAST (K) from other almond producing countries. Propagation and distribution of promising varieties is a regular practice by State department of Horticulture and SKUAS T (K). Besides bitter almonds, sweet almond and peaches are successfully used as root stock for almonds.

OTHER FRUITS:

The other important deciduas fruits grown in the state are pear, cherry, peach, plum and apricot. The usual root stock used for pear is quince. Peach, Plum and Apricot are usually raised on apricot seedlings. Success in all these cases is fairly good. Apricot stones are either directly sown in the nursery beds in December or these are stratified through winter months and sown in the month of March. Cherry is usually raised on suckers obtained from under cherry plantations. The scion over growing the stock at the bud union is however, a common sight in cherry plantations.

ORCHARD MANAGEMENT:

LOCATION AND LAYOUT:

Apple, pear, peach, plum, cherry and almond orchards are generally well laid out. Pear, peach, plum, cherry and apricot do not generally occur as extensive plantations. Usually a few trees of these are scattered with in most apple orchards. their number however, is more in the orchard in the vicinity of the capital city of Srinagar.

Apple plantations occur throughout Kashmir valley up to elevations of 6500 feet above sea level. Extensive new plantations are seen in the uplands (Karewas) where here to fore only very poor crops of maize, wheat, Barley, pulses or oil seeds used to grow. The district Baramulla in Kashmir decision has over 50 per cent of the total apple acreage. The other important apple growing areas in the state are Kupwara, Budgam, Anantnag and Srinagar districts. In Jammu division some quantities of apple are grown in Doda, Poonch and Kathua districts. Ladakh division also has a! small area where apple are grown successfully (Farooqui, 2004).

Almond orchards are generally in the uplands and sloppy areas. Extensive plantations exist in the areas' of *Khanmoh, Lethpora, AVI'antipora, Koil* and *Charzsharief* Walnut plantatipns are generally restricted to village common lands and compounds in the valley but in the higher elev<itions extensive plantations are seen in *Breng, Verinag: Qazigund, Shangus, Kangan, Wangat* and *Lolab* areas.

Old apple orchards are laid out in square system at a plant to plant distance of 18-25 feet. Most new plantations are if 1 triangular system with distance from tree to tree maintained at 18-21 feet. Almond trees are planted 16-18 feet apart. Walnut trees in the valley are mostly in grooves. In areas with extensive plantations a distance of 30-40 feet from tree to tree is maintained.

TRAINING *AND* PRUNING:

Apple trees are usually maintained at standard size with crown coming out about 5 feet from the ground level. The trees are generally trained to open centre. This enables good aeration in the orchard and sunlight penetrate_. well in to the trees. The maintenance of a tall stem ensures relative safety from stray cattle:' This has been essential because all farmers would not afford proper fencing of their orchards. 1 he apple trees are generally pruned annually to remove diseased and dried branches. Branches crisscrossing with other branches and water sprouts are also removed regularly. Annual pruning also enables the fanners to keep their trees in proper' form and within manageable size.

Open centre training is steadily being replaced by modified leader system. In the open centre trained trees all scaffold branches generally originate from the same level and it is not uncommon to notice heavily bearing trees splitting along the middle of the stem. Same problem arises whenever there is a heavy snow fall. These disadvantages of the When centre system have prompted the researchers of SKUST(K.) to advocate modified leader system of training, In newly developed orchards this system is thus gaining popularity,

Other kinds of fruit varieties are usually pruned only to the extent of removing diseased and dried branches, water sprouts and other crisscrossing branches.

IRRIGATION:

Rainfall being generally well distributed over the growing season, no irrigation is usually given to the orchards. It is' only during periods of prolonged drought that 2 - 3 irrigations are given in such of the orchards where water is freely available. In such orchards flood irrigation is the usual practice. Basin irrigation is given by some progressive orchardists.

Large orchard areas, however, are located in such areas where presently no irrigation facilities are available. Most of these areas are on uplands (karewas). In order to make water available in such areas deep tube wells to lift irrigation needs to be arranged. State department of horticulture in collaboration with SKUAST (K.) is vigorously 'popularizing water conservation techniques like mulching etc, and offering technical guidance as well as financial assistence to fruit growers in adoption of micro irrigation for high density fruit orchards. It needs to be mentioned, however, that periodical droughts are not restricting plant growth or fruit development to any alarming extent. It is only during early establishment of the orchard that there is heavy mortality of plants during periods of prolonged drought (Farooqui 2004).

MANURE AND FERTILIZER APPLICATION:

Manures are not available with the farmers in plenty. Farmers first choice for the li1tle quantities of manure available with them is its application in their rice fields. Nevertheless some quantities of farm yard manure available with the progressive fruit farmers go in to application in their orchards. Mostly the orchards in the vicinity of villages only are benefited on this account.

Application of fertilizers has been adopted as an important orchard management practice by a sizeable number of orchardists. Emphasis has mostly been on NPK. The orchardists are also advised to get their soil in their orchards tested before finally deciding upon the quantities of fertilizers to be used. Efforts are on to provide facilities for tissue analysis as well.

Phosphatic fertilizers are applied immediately after leaf fall. Nitrogen and potassium is applied in split dozes, Y2 before flowering and other half about three weeks after petal fall in case of mid season and late varieties of apple, pears and walnuts. In case of early varieties of apple and cherries, peaches, plums and apricots application of nitrogen and potash in full doze is given in early spring. In rain fed areas full doze of nitrogen and potassium fertilizers is given to all kinds of fruits before 1lowering stage in spring.

FRUIT VARIETIES:

The most popular apple varieties under which over 90 per cent of the total area is occupied are Red Delicious, Maharrji, Ambri, American Apirouge, Cox's orange pippin, Royal Delicious, Benoni and Baldwin. Most wide spread out of these are Red Delicious and Maharaji both together occupying nearly 60 per cent of the area.

Red Delicious is an excellent variety. It develops superb cc lour and is juicy with crisp flesh. It however, deteriorates fast in ordinary storage. Top grade of this variety is usually stored in cold stores at Delhi.

Maharaji is a vigorous tree with prolific bearing capacity. The fruit attains large size with excellent colour. It is very crisp and quite juicy and compared to Red Delicious is sub acidic and possess better storage capacity and is relatively much less susceptible to apple scab. In fact apple scab usually affects only fruit and not the foliage.

Ambri is indigenous to Kashmir. Fruit is sweet with excellent aroma and colour development. Flesh is crisp but juice content is relatively less. Storability is excellent. The trees on seedling root stocks come to bearing after over 10 years of plantation. The variety is susceptible to apple scab. The university has evolved and released high quality, high yielding and scab resistant apple varieties like *Lal Ambri., Sunheri, Akbar, Firdous, Shireen* and *Gulshan*. In addition few high quality disease resistant varieties are in the pipe line for future release (Farooqui 2004).

Amongst pears largest acrcreage is under *William* variety This is closely followed by *Chinese Sandy Pear*. Other important varieties though grown in relatively less acreage are *Beurre-de-Amanlis, Vikar of Winkfield, Jorgonelle, Beurre Hardy* (Farooqui 1990). Among peaches *Quetta* occupies the largest acerage followed .closely by *Saharanpuri*. The former is the last maturing variety and the latter is the earliest maturing variety. *Elberta* and *Peshawari* varieties are also grown but the farmers. Among apricots, the most common variety is *Amba. Australian* and *Gilgati Sweet* varieties have also become popular. Varieties such as *Ka is Moore Park, New Castle, St. Ambriose, ,Turkey* and *Charmagz* have also become popular among fruit growers recently.

Cherry cultivars, *Early Purple, Black Heart, Guigue Nair Gross Lucenta, Guigue Nair Ilative, Biggarreau* and *Bigarreau Nair Grossa* are grown in foot hills and uplands areas of the valley. The average yields in the state are considerably low as compared to other cherry producing countries. The variable and frequently poor production is due to pollination failures leading to inadequate fruit set. *Black Heart* followed by *Bigarreau*

Napoleon mature earlier and *Bigarreau Noir Grossa* is the late maturing one (Farooqui 1979).

The Jammu and Kashmir state produces a fairly good quantity of quality plums consisting mainly of European plums (*Prunus domestica* L.). The intermediate zones of Jammu province like Doda and Poonch have fairly good prospects for growing plums but:cit present the re-existing plantations do not Introduce plums of as good quality as those in Kashmir.

Early season plum varieties which are commonly growl! by the fanners arc *Mariposa, New Plum* and *Sharps Early*. Varieties *Grand Duke, President, Sugar Prune, Wickson, Prune-de-Agen* and *Satsuma* are considered as better yielding and high quality varieties.

CHALLENGES AND CONSTRAINTS IN APPLE PRODUCTION

Though productivity of temperate fruits in J &K State is higher than i

H.P, Uttaranchal (Table-I), yet it is not comparable with productivity of the advanced countries (Table-3). There are many reasons behind the low productivity. The main challenges being faced by the apple industry are as follows:-

1. Old and senile orchards

Most of the old orchards have lived their age to a great extent. Such orchards do n(lt produce annual extension growth because of inadequate fertilization and pruning practices, which does not allow the proper growth of foliage, synthesis of photosynthesis etc.

2. Narrow genetic base

Fruit production, particularly apple, is based on a few varieties like Red Delicious, Golden Delicious, Benoni, American Apirouge etc. Most of the cultivars are very old and have strong tendency to alternate bearing. Apart from this, most of the trees are very old and have degenerated genetically and are not yielding economically in comparison to presently available promising cultivars of different fruit kiilds.

3. Lack of quality planting material

To replace the old orchards, availability of good quality planting material is lacking. The plant material which is supplied to fruit growers is not possessing qualify attributes and plants are generally infested with diseases and pests like woolly aphid. Thus, there is urgent need of quality planting material for both rootstocks and the scion cultivars.

4. Poor and faulty nutrition

Fruit crops are mostly grown on rain fed and exhausted land which leads to serious water and nutrient deficit. Rain-fed orcharding further accelerates the nutrient management problem to a great extent. Frequent dry spell during May-June and September-November makes the nutrients unavailable to the plants even if they are applied. Leaching losses during erratically excessive rains further affect the health of trees.

5. Poor soil and water management conditions

Most of the orchards are planted on sropy lands, which are prone to runoff losses of nutrients and hence the soils are left nutritionally sick. The soils are not deep and fertile, thus the tree growth and yields are affected. Rainy season erodes the fertile land; and also causes the landslides etc; which results in deficiency of micro-nutrients.

6. Lack *of* pollinizers and pollinators

For effective pollination, 33 percent proportion of pollinizing varieties are needed to obtain adequate fruit set. Orchardists have planted even less than 10 percent plants as pollinizer, which is very low. Non-availability of bee hives is also a major problem and due to this reason, the use of honey bees for pollination has not picked up to a great extent. Orchardists are also not very conscious about using honey bees; hence, lack of pollinizers and pollinators is contributing to a great extent for the low fruit set in the orchards.

7. *Poor* canopy management

Fruit glowers are not taking care about the proper training and pruning in temperate fruits. In most of the orchards, fruit trees are growing like wild trees. The orchardists are not following scientific practices which imbalance:: the root to shoot ratio and cause great loss in fruit set and fruit development. The profuse foliage growth does not permit the exposure of sunlight to the developing fruits. The unavailability of trained pruners is also a problem.

8. Incidence of pest diseases

A number of diseases and insects have been identified which are posing great threat to the temperate fruit *crops* and reduce the yield. The major diseases and pests are scab, canker, root rot, pre-mature leaf fall, collar rot, mites, woolly aphid and gummosis: These cause a huge loss to the productivity of the fruits.

9. Faulty Crop regulation

In 'on' year the excessive fruit set is also a problem for getting the quality fruit with large to medium sized fruits. Therefore: to get the quality fruit, proper, hand and chemical thinning practices are required to regulate the crop. Thus, non-adoption of flower and fruit let training practices have also led to the alternate bearing of these pollinizers thereby affecting cropping.

10. Low planting density

The old orchards have been planted under traditional systems of planting at 6x6 m spacing. These orchards take 15-20 years to come into commercial bearing in comparison to high density orchards raised on dwarfing rootstocks which come into commercial fruiting after 4-5 years. The planting of dwarfing rootstocks also accommodates more number of trees in the same piece of land. This directly increases the yield per unit area. Therefore, planting on vigorous rootstocks with higher spacing is also a reason for low productivity per unit area.

11. Replant problem

This is a second generation problem in which young saplings in replanted orchard at times suffer heavy casualties. It is believed that there are biotic and a biotic factors, which lead to soil sickness in the old orchard as a result of which survival of young plantation is adversely affected. Formalin or ethyl bromide fumigations and soil solarization have been reported to enhance survival of replanted sampling. Application of single super phosphate has also been found beneficial to contain replant problem.

12. Post harvest and market related problems

Post harvest handling and marketing of the fruits is a very important factor, which influences the income and profit of growers and ultimately affects interest of orchardists. There are many post harvest value addition and market related problems, which are being faced by the orchardists. In general, following problems are being faced by the growers:

- **Scarcity of packaging materials Lack of post harvest and**

processing infrastructure.

- **Dominance of middleman in the market.**
- **Lack of grading practices**
- **Non-availability of proper transportation and cool chain facilities.**
- **Shortage of skilled and unskilled labourers.**
- **Inadequate knowledge of market system.**
- **Financial problems.**

STRATEGIES FOR IMPROVED PRODUCTION AND QUALITY

Apart from contributing significantly to GDP, horticulture sector has provided greater opportunities for employment during pre and post-harvest management besides being eco-friendly to the environment. The scenario, therefore, requires concerted efforts for technology interventions to address various challenges and constraints in fruit production.

Widening of cultivar base

The continuous use of traditional cultivars and their gradual degradation over the years and slow change over to new promising varieties has been mainly responsible for low productivity and poor quality of produce. Thus eff0rts should be directed towards following measures:

- Concerted efforts should be made to bring about genetic improvement in fruit crops through hybridization and intra--clonal selection.
- Introduction and adoption of high yielding and regular bearing varieties having high dessert quality, shelf life and resistance to Diseases and pests.
- Faster multiplication of new improved fruit cultivars spur cultivars in apple like Red Fuji, Red Chief, Oregon Spur, Red Spur, Silver Spur, Well Spur etc early and better colouring standard cultivars like Vance Delicious, Top Red; high yielding hybrids (Table 4&5)

like Lal Ambri, Sunheri and Akbar; scab resistant varieties like Shirecn and Firdous etc.

- Introduction and multiplication of virus free clonal rootstocks.
- Utilization of modern biotechnologies for virus cleaning and rapid multiplication of the plants wherever technically and economically viable.
- Modernization of fruit nurseries for rapid propagation and mass multiplication of quality material for distribution to the growers.
- Establishment of mother tree orchards of temperate fruits in selective areas by importing bulk plant material from other countries to make available the scion wood for grafting/budding.

Application of proper technology for effective cross pollination

The unfavorable weather conditions at the time of flowering restrict the bee activity resulting in hindrance in cross-pollination leading to poor fruit set. Under such conditions only solution is to increase the number of trees of pollinizers in the orchards.

Golden Delicious have mail1ly been planted as pollinizer variety by the apply orchardists, the flowering period of which often dies not synchronize with commercial varieties. Therefore, we are advocating to fruit growers to plant more two pollinizing varieties in their orchards for e.g. McIntosh, Black Ben Davis, T.E. Worcester (for early flowering varieties) Golden Delicious, King of Pippin, Yellow Newton, Red Gold and Lord Lambourne (for mid flowering varieties), Rome Beauty, Granny Smith, Worcester, Peannain and Wealthy (for late flowering varieties).

Steps should be taken to increase availability of honeybee colonies to the farmers through the involvement of private bee breeders. The. incentives sholl ld be given to the farmers so that they keep require number of bee colonies in their orchards for effective cross-pollination and better fruit set.

Integrated Orchard Floor management and Plant Nutrition

Fruit cultivation is being main) done under rain-fed conditions. Water being limiting factor in the fruit production programme, the technologies for the conservation of soil moisture like mulching of tree basins with different mulch materials like grass, plastic sheet etc. should be encouraged. Installation of drip irrigation system for economic: use of fertilizers (fertigation) and scarce irrigation water in apple trees for increasing the productivity should be highly subsidized.

The balance nutrition of the fruit trees is an important factor in increasing the fruit productivity and improving the quality of the fruit produce. The diagnosis of the nutrition status of the fruit plants through the technique of the plant tissue analysis has to be given emphasis. Availability of soil. moisture is essential for nutrient uptake and therefore, technology for in-situ moisture conservation, rain water harvesting and its efficient use on rolling and undulating topography of hills should be promoted.

Organic Fruit Production:

Due to continuous use of mineral fertilizers, our soils have been badly depleted and their structure has been disturbed. Such soils have low water holding capacities. Organic farming can be a major option because of increasing realization that accumulation of chemical residues is the soil, water and plants as a consequence of continued and inefficient use of chemical fertilizers and pesticides can result in severe human and animal health problems. Health consciousness about food and non food products and their consumption is dr2matically changing in favour of organic products. Though this may result in lower yields but net returns are more. Efforts need to be concentrated on recycling of agricultural green waste. In this case organic material is returned to the soil to retain the humus content of soil. This also checks soil erosion and depletion of water resources. The economic viability of fruit: growing: whether conventional or organic, closely follows the level' of soil nutrition and pest arrangement success in the orchard. Production protocols in organic farming by way of various technology inputs entail higher expenses. The price premium in case of organic products has the potential of offsetting the increased production expenses.

Strengthening of Post harvest Infrastructure

Heavy post-harvest losses to the tune of 25 per cent to 30 per cent cannot be sustained for long. In order to meet challenge of nutritional security concerted efforts are required for the creation and strengthening of post- harvest infrastructure (Farooqui 2003) on the following aspects:

- Maturity standards and harvesting techniques.
- Post-harvest disease control.
- Primary processing and on-farm storage.
- Availability of packaging material.
- Pre-cooling, zero energy cool chamber and cool chain system.
- Processing of unmarketable surplus fruits. Area Expansion

Most of the orchards in the state are around 30-40 years old and need replacement. Further bringing additional 1.70 lakh hectares will add to the demand of pedigree plant material. Considering area expansion at the rate of 10,000 hectares per year and devoting 40 per cent area under apple, it shall entail yearly area expansion of 4000 hectares. Assuming 75 per cent of this area shall be devoted to conventional planting and rest to high density orchards (250 plants per hectare) and 15.0 lakh plants for high density orchards (1500' plants per hectare). Imperatives of increasing production of apple through high density orcharding can bring about spectacular improvement of productivity per unit area (Table 7&8). Any expansion in area or rejuvena1ing, replanting or reorientation through replacement is not possible without producing quick and healthy plant material. This calls for holistic approach for developing necessary infrastructure facilities like well equipped modern nurseries, tissue culture laboratories, poly houses, green house facilities, well maintained mother Stocks etc.

Transfer of Technology

Fruit cultivation in J&K State like other Himalayan States, is carried out by a large number of small and marginal farmers scattered all over the state. As such the transfer4 of technology component is the most important and crucial aspect in the development of horticulture. In order to ensure the transfer of technical know-how to the fruit growers in the far-flung areas of the state, latest information dissemination technologies shall have to be adopted. The technology dissemination are "on farm" demonstration/trials, farmers study.. 'tour and training programmes; utilization of the audio visual aids for the distribution of the literature; organization of the horticulture exhibitions, fanners fairs, kisan diwas, seminars and workshops on various aspects of horticulture etc.

Demand Projection

Area expansion of apple also needs to be considered from the stand point of demand projection at national level. According to Recommendatory Dietary allowance (RDA) of ICMR per capita consumption of fruits should be 120 gram per day. Population of India, during 2000 being around one billion, would require about 62.50 million tones of fruit (Table-)

Considering J&K states 2.41 percent and 2.0 percent share of total fruits and apple respectively in the fruit basket at national level, the state should have contributed total fruit production of 1.5 million tones, out of which apple production should hwe be_n to the tune of 1.25 million tones. Currently there is a gap of 4.1 lakh tones in total production and 3.4 lakh tones in apple production.

Considering demand projections of 2010 and 2020 and 2.0 percent share of apple to the fruit basket the J &K state is expected to meet the requirement at national level which works out around 1.62 and 1.96 million tones for the year 2010 and 2020 respectively as against current production of 0.91 million tones. TI ese demand projections reflect domestic demand for table consumption and do not include the requirement of processing industry and export demand that may increase with the establishment of Agri-Expo Zone for apple in J&K state. There has to be, therefore, concerted drive to bring about significant increase in the production of quality fruits as out lined in, road map for strategies to be followed. Conclusion

Though the progress made in area and production of dry and fresh .fruits in J&K State is quite remarkable, yet the diverse and rich agro ecological farming situations present vast scope for improving production and quality of variety 'if fruits. However, mountain specific economic niches in J&K state can only be gainfully harnessed through structural change? in. horticultural production systems via diversification, value addition, harmonious integration of modern and indigenous know-how, organized marketing strategies and Infrastructural. Development for the sustainable production of the temperate fruits and their processed products. In order to bring about significant improvement in apple production and quality, it can be concluded that:

- Overcoming of constraints and meeting various challenges confronting apple industry shall lead LO realization of considerable production and productivity potential.
- Availability of healthy plant material of diverse fruit kinds is a critical requirement of fruit industry which needs to be met on war footing in highly planned and organized manner.
- Reorientation of *fruit* industry towards judicious mix of high density *fruit* production, conventional orcharding and organic farming should be based on sound technological footing on the hand and pragmatic imperatives of logistic considerations on the other.

Table-1 : Area, Production and productivity of fruits in J&K (2001-2002)[1] and other Himalayan States (2000-2001)[2]

State	Area (000' ha)	Percent share[4]	Production (000' t)	Percent share[4]	Productivity (T/ha)
J &K[1]	228.6	5.70	1097.2	2.41	4.95
Arunachal Pradesh	51.1	1.31	123.1	0.27	2.41
Assam	107.0	2.75	1293.8	2.85	12.09
HP	213.0	5.48	438.3	0.96	2.05
Manipur	24.7	0.61	118.7	0.26	4.81
Mizoram	18.0	0.46	66.7	0.15	3.70
Nagaland	24.7	0.61	290.4	0.64	11.75
Sikkim	9.4	0.24	10.0	0.02	1.06
Tripura	28.9	0.74	450.8	0.99	15.59
Uttranchal[3]	198.8	4.58	541.0	1.35	2.72
Total (Himalayan States)	**816.5**	**21.00**	**4170.1**	**9.19**	**5.10**
India	**3886.6**	**-**	**45370.0**	**-**	**11.67**

Sources:

1. Directorate of Horticulture, J&K Govt.
2. Agricultural Research Data Book (2003) IASRI, ICAR.
3. National Horticulture Board Data Base(2002)
4. Per cent share at national level

Table-2: District wise area, production and productivity of temperate fruits in Kashmir valley (2001-02)

District		Area (000'ha)	Production (000't)	Productivity (t/ha)
Anantnag	(T)*	36.00	204.00	5.66
	(A) **	15.71	161.18	10.71
Baramullah	(T)	30.11	482.00	16.00
	(A)	24.94	469.30	18.81
Pulwama	(T)	28.50	147.00	5.15
	(A)	15.05	121.90	7.75
Budgam	(T)	22.30	60.00	2.69
	(A)	7.71	45.53	5.90
Kupwara	(T)	20.60	69.00	3.34
	(A)	13.43	60.00	4.46
Srinagar	(T)	10.10	48.00	4.75
	(A)	4.27	36.10	8.44

T *: Total Fruits, A ** : Apple

Source: Total Fruit, GoJK (2002-03). Directorate of Horticulture Planning & Monitoring Report.

Apple: Directorate of Horticulture. J&K Govt

Table-3: Productivity (t/ha) of principai temperate fruits of J&K state (2001-02) as compared to developing and developed countries (year 2002)

Kind of Fruit	J&K	Developed countries	Developing countries	China	USA	Australia	New Zealand	India
Apple	10.09	11.02	9.47	8.17	23.03	11.80	38.04	5.68
Walnut	1.39	2.46	-	1.61	3.16	-		1.05
Almond	0.57	1.20	-	2.00	2.14	2.05	-	-
Cherry	3.00	4.20	7.14	3.70	5.53	4.21	1.32	-

Source: Directorate of Hort. GoJK (2001-02) for J&K state.
FAO 1990-2002 for developed and developing countries

Table-4: Salient Features of improved varieties of apple and tree nuts released

Apple

Varieties released	Salient Features
1. Lal Ambri (*Ambri x Red Delicious*)	• Regular bearing • Shorter gestation period • Highly coloured than Ambri • Characteristic Ambri aoma • Large size
2. Sunheri (*Ambri x Golden Delicious*)	• No rusetting • Better flavour than Golden Delicious • Medium size
3. Akbar (*Ambri x Cox's Orange Pippin*)	• Heavy bearing • Deep red streaks • Large size
4.Shireen (*Lord Lambourne x Gavin*)	• Scab resistant • Red coloured • Medium to Small in size
5.Firdous (*Melba x Malus floribunda*)	• Scab resistant • Red coloured • Medium size
6. Gulshan (Lal Ambri x Prima)	• Scab resistant • Red coloured • Medium to large size

Table-5: Productivity potential of apple varieties released by SKUAST(K) in the age group of 20-25 years.

Variety	Productivity (t / ha)
Lal Ambri	45.0
Sunheri	35.0
Akbar	60.0
FIRDOUS	18.0
SHIREEN	16.0
GULSHAN	15.0

Table-6 : Projected production and demand of fruits at national and state level.

Parameter	2000-03	2010	2020
Population (billion)	1.0	1.16	1.32
Fruits (house hold demand, million tones)	62.50	81.0	98.0
Fruit production (India, million tones)	40.05	60.0	80.0
Fruit production (J&K state, million tones)	1.09	-	-
J&K share in fruit production at national level to meet household demand (million tones)	1.50	1.95	2.36
Gap in fruit production (million tones)	0.41	-	-
Apple production (J&K state, million tones	0.91	-	-
J&K share in apple production to meet household demand at national level (million tones)	1.25	1.62	1.96
Gap in apple production (million tones)	0.34	-	-

.Table 7 : Productivity of apple in the age group of 4-5 years under various training and high density planting systems managed under micro-irrigation and fertigation at SKUAST(K).

Cultivar	Root stock	Training system	Planting distance(m)	Planting density (tree/ ha)	Yield(t/ha)
Starkrimson	MM106	Central leader	3x3	1111	15.0
Golden Delicious	MM106	Central leader	3x3	1111	20.0

Table 8: Productivity of apple under high density orchards of various age groups

Cultivar	Rootstock	Training	Planting distance	Plant density (plants/ ha)	Yield (t/ha)	Tree age (Years)
Colden Delicious	M-27	Slender bushes	3.5 x 1.75	1623	47.18	4
Fuji	M-26	Central leader	1.0 x 3.5	571	58	7
Starkrimson	*M.sylvestris*	Spindle bush	4.0 x 2.0	1250	30.5	10
Golden Delicious	*M.sylvestris*	Spindle bush	4.0 x 1.5	1250	44.1	10

Adapted from :- Antognozzi, *et al* 1988, Shiozaki 1989, Senin and Kovaleva 1992

AREA AND PRODUCTION (UNDER CONVENTIONAL ORCHARDING) OF MAJOR FRUIT CROPS IN INDIA WITH A POTENTIAL FOR HIGH DENSITY ORCHARDING

Fruit	Area (Lakh ha.)	Production (Lakh t)	Productivity (t/ha.)	Per cent	
				Area	Production
Apple	1.87	10.84	5.79	7.78	3.95
Banana	3.39	61.76	18.21	10.49	21.87
Citrus	3.49	27.58	7.99	10.80	9.76
Mango	10.10	85.04	8.42	31.25	30:11
Papaya	0.39	9.05	23.00	1.21	3.20
Pineapple	0.55	7.86	14.14	1.70	2.78
Total	19.79	202.13	-	63.23	71.67

Recommended Pollinizing varieties of apple for adoption by fruit farmers

a.	Early varieties	1. Mc Intosh 2. Black Ben Davis 3. Tydeman's Early Worcester
b.	Mid flowering varieties	1. Golden Delicious 2. King of Pippin 3. Yellow Newton 4. Red Gold 5. Lord Lambourne
c.	Late flowering varieties	1.Rome Beauty 2.Granny Smith 3.Worcester Pearmain

Broadening base of varietal spectrum (Main varieties).

- **Red Fuji**
- **Jonica**
- **Red Chief**
- **Imperial Gala**
- **Florina**
- **Summer Red**
- **Oregon spur**
- **Golden spur**
- **T.E. Worcester**
- **Vance Delicious**
- **Wells spur**
- **Starkrimson**
- **Miller spur**

HOKARSAR - KASHMIR'S WONDER WETLAND

By : K. Kuldeep Singh Jamwal

On a beautifully clear frosty morning in mid-February, Father and I are expectantly waiting for the most mysterious marvel of nature outside Hokarsar wetland reserve. Barely 10 kms from Srinagar on the Gulmarg road, the long avenue of poplars at the crack of the dawn, thickly crusted with a layer of yesternight's snow seem like a surrealistic painting by Dali. A thick layer of fog looms all around giving a feeling of being in the clouds. The biting -8°C temperature numbs our hands and feet despite protective gloves and layers of woollens. While cups of Kashmiri *saffron kahwa tea* keeps the body warm, the mind's eye is attuned and looking in the twilight to pick the first skein of *Grey-lag geese* as it appears in the distant horizon against the back drop of majestic Gulmarg range of mountains. Before any of us can spot the graceful birds, it is the honking that announces their departure and farewell from the Valley on their way to distant lands in Tibet, China and Russia. Coming low and kissing the treeline, the V-formation of geese flight passes us overhead in the direction of the Valley formed by the Harmukh and Sindh range of the Himalayas. For another two hours the scene will be enacted with some two to three thousand birds migrating daily in several flights of upto 50 geese in the coming fortnight.

As spring approaches in last week of February the fragrance of pussy-willow fills the air around the Hokarsar duck reserve. Delicate, nascent leaf buds of willows and other trees become active after the winters' dormancy. The wetland suddenly transforms from the drab motley-brown and grey of winter to patches of green reeds, wild mint and other aquatic plants. The magic of migration started by the geese will soon be followed suit by *mallard*, *teal*, *pintail* and another 14 species that have made Kashmir's wetlands their home in the preceding four months. Hokarsar at its prettiest, is playing host to some 40 to 80 thousand graceful ducks and geese in their beautiful migratory plumage. The honks, quacks, whistles and squeaks add musical notes to the symphony; a perfect rendition that goes with the panoramic scene being enacted by the avian visitors.

Kashmir, famous throughout the world for its natural beauty, lofty snow capped mountains and streams has some of the finest wetlands and bogs, which for aeons have provided peaceful environs and excellent habitat for ducks, geese, snipes and several other aquatic and marsh loving birds. Although most of the birds would migrate in March, some species particularly *garganey teal, pochards* and *pintails* migrate as late as ending May. Abundance of food in and around the wetlands, especially the paddy fields, fattens them to take on the arduous 1000-3000 km journey to their breeding grounds.

Whereas migratory geese flights are an early morning affair, mallards and most other ducks generally migrate at dusk, just as the sun sets behind Gulmarg hills with a beautiful display of orange and red. However, in both the cases clear day or night as the case may be is essential for uncanny bird navigation. How these mysterious voyagers find their way with apparent ease over vast distances remains the unsolved riddle of migration. Some airline pilots have even reported flights of geese flying over Mt.Everest, a good 29,000 feet high up in the frigid atmosphere! Although the bird's vision plays the primary role in its sense of direction and position, ornithologist Gustav Kramer and many others think that the migratory birds are able to use the sun as compass and even have *time sense* which enables it to adjust its course to compensate for the sun's movement across the sky. *Pochards* and *coots* in particular migrate only during full moon period in late evenings, to avert any navigational errors!

With spring ending in May, the Hokarsar wetland presents a deserted look. A few *moorhens, dabchicks, jacanas* and *lesser terns* add a bit of splash of colour and activity. By now the gregarious wildfowl are going through their breeding season and busy raising two to three clutches in preferred wetlands in central Asia, Kamachatka, Lake Baikal, some parts of Ladakh, Tibet and northern China. Come September, and some quirk of nature again signals the wild ducks and geese to begin their south ward autumn migration. As if by magic, flights of ducks descend apparently from no where initially in hundreds, and then thousands till every open water is dotted by these graceful birds in Hokarsar. Strange though it may seem, the geese arrive in the Valley, as if by appointment on first of October; give or take a day due to vagaries of weather!

Tired due to long southward migration, the birds spend their time preening and basking in the late autumn sun, preparing for the relatively mild winter and snow in Kashmir. Abundance of water chestnut provides food galore to the geese. Ducks however, move out in the evening for feed in the harvested paddy fields. By November, migration is complete in Kashmir. Some species move further south to Bharatpur, Sultanpur, Pong-Dam and numerous small bogs in the plains of the country where the winter is warmer. Despite intense cold, Mallards and geese prepare themselves for the freezing winter in not only Hokarsar, but other wetlands like Hygam and Mirgund, resting in the reeds during the day for protection. Even several snowfalls accompanied by icy winds till the end of January does not dampen their spirits. Soon it is mid-February, and once again some strange physiological phenomenon triggers the urge for northern migration to their breeding grounds. The migration in Kashmir has come a full circle!

DEVELOPMENT & PERSPECTIVES OF HORTICULTURE IN JAMMU & KASHMIR

By: Ghulam Hassan Dar & Farooq Ahmad Peer

The Jammu and Kashmir is the only state in India which enjoys unique physiographic features, diverse climate and variable topography suiting the cultivation of diverse fruit and vegetable crops, grown in sub-tropical, temperate and cold arid regions. The State is located between 32°-17▯ and 37°-16▯ north latitude, 73°-26▯ and 80°-06▯ longitude and 81° east Greenwich, falling in the Western Himalayan region of Sub-continent. The total geographical area of the undivided State is 2,22,236 km^2, of which 1,38,942 km^2 (62.52% of total geographical area) is under the actual control of the State; the rest 83,294 km^2 (37.48% area) is occupied by Pakistan and China. The State lies at an elevation ranging from 2000 to 3500 m above sea level with average rainfall of 1,069 mm in sub-tropical (Jammu), 660 mm in temperate (Kashmir) and 80-90 mm in cold arid region (Ladakh). The average temperature in sub-tropical region is 24.5^{0}C whereas it is 13.3 and 5.3^{0}C in temperate and cold arid zone, respectively. Rivers Indus, Jehlum, Chenab, Ravi and Tawi are main drainage channels.

1. HISTORICAL DEVELOPMENTS IN HORTICULTURE SECTOR - A Brief Account

The fruit growing in Kashmir has been described in the ancient scrolls of Kashmir. The Kalhan's *"Rajtarangni"* and Alberuni's records have mentioned about the existence of numerous fruit varieties in the State. The history of fruit growing in J&K, therefore, dates back to 2000 BC wherein apple growing is reported. The apple cultivation was taken on large scale in the reign of Laltaditya in 1089 AD. Bamzai (1987) reported that these fruits were indigenous and grown for local consumption only. Mirza Hyder Doughlat (1542-1552 AD) in his book *"Tarekh-e-Rashidi"* gives some details about the excellence of Kashmiri apple. The fame of Kashmiri apple finds place in *"Tuzki Jahangiri"* wherein Kashmir apple has been praised in words *"The apples of Kashmir are known for their goodness."* Lawrence in his book *"The Valley of Kashmir"* has called Kashmir valley as fruit country. Baron Charles Huegel (1835) in his travelogue writes that *"apples in valley were plentiful and of many sorts."* During early periods fruit crops were raised through seeds only. Improvement through grafts seemed unknown in those times. Huegel has mentioned about grape cultivation like this *"It is only in Kashmir that wine is made from grapes in whole of India."* He was also responsible for the introduction of potato in Kashmir valley. Various exotic introductions are reported to have been made from distant countries like Syria, Central Asia, Persia, Afghanistan, China, France, England etc. by the nobles, preachers, administrators like Mughal/Afghan governors and other European functionaries.

Organized fruit cultivation in the State commenced in 19th century when European travelers, missionaries and British officials started visiting the Kashmir valley for various purposes. Jacuemont, a French, was the first botanist to visit Kashmir in 1831. Horticulture took organized shape in 1865 when Ermns, the Head Gardener of Public Works Department in France on the basis of preliminary survey in valley introduced some fruit plants in Kashmir at Cheshma Shahi, Srinagar in 1875.

During Maharaja Partap Singh's regime (1885-1925) much attention was focused on the promotion of horticulture and sericulture in the valley. Gollan made collection of about 25,000 wild fruit stocks and planted them at Bagi Pesu (Bagi Sundri) Sopore. It was the first government fruit plant nursery established in State for seedling grafting and their distribution in state-run orchards. It marked the beginning of nursery establishment in the State and boosted horticulture development in private sector as well. The grafted fruit plants were also raised at this nursery. Hence, without exaggeration it may concluded that fruit orcharding on commercial lines in Kashmir valley owes its origin to Bagi Pesu (Sopore).

The horticulture sector received further impetus in 1906 with the establishment of Department of Agriculture and Sericulture which was later bifurcated into the Departments of Agriculture and Sericulture. The introduction of San Jose scale pest into Kashmir in 1911 by British and French visitors hit the fruit industry for about two decades. The San Jose scale pest was brought under control in 1940 with the technical assistance of Imperial Council of Agriculture Research (ICAR). By this time the original plants had been ravaged and records lost. After this worst experience the Imperial Council of Agricultural Research sanctioned a scheme for the "*Survey of Deciduous fruits in Kashmir*". The scheme remained operative from April, 1945 to March, 1952. This survey scheme lead to the collection and identification of 113 apple cultivars, 62 pear cultivars, 31 plum cultivars and 14 cherry cultivars. These cultivars were fully described and sketches and illustrations prepared. The final report along with monograph was submitted to Vegetables and Fruits Committee (ICAR) in November 1950 with its recommendations for adoption by the ICAR. The identified and propagated stocks of fruit plants were planted in a '*Hortorium*' at Lalmandi, Srinagar in 1951 and then re-transplanted at Fruit Research Station, Shalimar, Kashmir (present day SKUAST-K) in 1952-53. Hand sketches of fruits, twigs, leaves and buds were made by an eminent Kashmiri artist D. N. Wali and preserved by the Department of Agriculture/Horticulture for ready reference and regular display at annual exhibitions until the advent of the photographic era.

Until the beginning fifties Kashmiri growers continued the propagation and production of acidic and sub-acidic cultivars of apple and quince as most consumers were Europeans who preferred dessert and cooking varieties of acid and sub-acid nature. A shift towards the propagation and production of mild acidic and sweeter cultivars of apple occurred in fifties owing to the more liking of consumers for sweet varieties (Wanchoo, 2000). The commercial trade in fruit crop cultivation is generally governed by the selection of varieties/cultivars for production as per the demand of their consumers.

Considering the potential of fruit cultivation in the State the J&K Government carved out a separate Department of Horticulture from Department of Agriculture in 1962. The purpose was to provide a solid base for horticulture sector in the State. Adequate funds were earmarked for planned horticulture development and qualified manpower positioned at each tehsil level. A Fruit Research Station was also established at Shalimar. Since then the Department took many strides and successively leaped ahead. A number of development schemes were introduced to bring more and more grey areas under fruit culture. Thrust was also laid on proper nutrient management and pest and disease control especially apple scab, powdery mildew, woolly aphis, San Jose scale etc. The extensive use of chemicals in horticulture crop began in 1975 when apple scab disease played havoc to the industry.

Two training-cum-canning centers were established on small scale in late sixties at Srinagar and Jammu to take care of post-harvest processing of fruits and vegetables. With the increase in area and production, a separate Department of Horticulture Planning and Marketing was created in 1983 with thrust on proper processing and marketing of horticulture produce. Various marketing units were established in important markets outside the state so as to help the growers to fetch better returns and culminate the role of intermediates and commission agents. Grading/handling cum pack-houses, ware-houses and cold storage facilities were established in major producing centers throughout the valley. Later, J&K Horticulture Processing and Marketing Corporation and State Agro-industries Development Corporation also helped in vigorously pursuing the goal of developing horticulture as major industry in the State. One big processing centre was established at Nowpora, Doabgah, Sopore in 1981 and another one at Rangret (Budgam) in 1999 under private sector. Many marketing societies and non-government agencies were also involved in the upliftment of fruit growers.

2. PRESENT STATUS OF HORTICULTURE

The J&K State has only 24.16 lakh hectares of the total geographical area (under actual control) under agricultural activities, of which 7.34 lakh hectares is net cropped area. The net irrigated area to the net sown area in J&K is 42.1%. The area under fruit crops is 2.65 lakh hectares (2005-06 data) while additional 1.70 lakh hectares can be brought under new fruit and other plantation crops, if wastelands etc. are converted to productive land through command area development. The State has populations of about 100 lakh spread in fourteen districts of the State. The population density in J&K State is about 100 persons km^{-2}.

Most of the land in J&K State is fragile, inaccessible and marginalized with unique socio-economic and cultural issues. Amongst the limited options available for the development of area, horticulture has assumed greater significance in view of its relevance to food security, fuel production and environmental protection. The eminent scientist Dr. M. S. Swaminathan foresees that horticulture in future will occupy pride place both in respect of economic power and nutritional needs. The fruit cultivation is perhaps the only cropping system where economics and environmental concerns go together. On the basis of agro-climatic features has been divided into four main zones (Table 1).

Table 1: Main agro-climatic zones of J&K state

Zone	Districts
i. Sub-Tropical	Kathua, Jammu and lower belt of Udhampur
ii. Intermediate	Doda, Rajouri, Poonch and higher belts of Udhampur
iii. Temperate	Anantnag, Pulwama, Srinagar, Budgam, Baramulla and Kupwara
iv. Cold Arid	Leh, Kargil

The J&K State, especially Kashmir valley, owing to its peculiar climate has the great potential for quality temperate fruit and vegetable production. In the State about one million farming families are involved in agricultural pursuits of which more than 0.5 million farming families dependent on horticulture activities. The horticulture sector provides direct and indirect employment to about 25 lakh people annually. The State has created a niche in the field of temperate horticulture especially in apples, walnut, almond, cherry, plum, peach and apricot. About 2.65 lakh ha area in the State is under fruit crops (2005-2006 data) of which major chunk (2.27 lakh ha) is covered by temperate fruits only. The total fruit production of J&K State as per 2005-2006 data is 13.73 million tonnes of which temperate fruit contribute more than 95% (13.20 million tonnes).

The J&K state contributes 48% of the total temperate fruit production in India, followed by Himachal Pradesh and Uttar Pradesh. Kashmir has emerged as the largest apple producing region in the country. Apple, walnut and almond rank 1st, 2nd and 3rd in area and production in the State, covering 46.7, 27.3 and 8.7% area respectively, with 84.0, 6.7 and 0.9% contribution towards fruit production. Districts Baramulla, Anantnag and Pulwama rank 1st, 2nd and 3rd in apple production, respectively, while Anantnag, Pulwama and Baramulla rank 1st, 2nd and 3rd in walnut production, respectively. Production of almonds is mainly concentrated in districts Pulwama and Budgam. Cherry production is mostly confined to district Srinagar because of its close proximity to main market, airport and processing units. The pear, plum and peach growing areas are also in and around the district Srinagar but the area under their cultivation has considerably shrunk due to unplanned urbanization.

A substantial progress has been made in previous plan periods in fruit cultivation with respect to the area coverage, production and productivity but still vast potential exists for both vertical and horizontal expansion. The yield of apple and walnut per hectare has shown a substantial increase from 4.12 to 10.05 and 0.79 to1.38 tonnes, respectively, from 1975 through 2005-06 (Table 2). The growth in apple is highly encouraging in J&K state (10 tonnes) in comparison to HP (6 tonnes) and UP (3 tonnes).

Table 2: Area, production and productivity of major fruits in J&K (2005-06 data)

Crop	Area (ha)	Production (t)	Productivity (t/ha)
Apple	1,09,950	11,05,417	10.05
Pear	10,994	41,905	3.81
Cherry	2,570	8,296	3.22
Walnut	76,934	1,06,593	1.38
Almond	15,535	14,316	0.92
Other	49246	97,047	1.97
Total	**2,65,229**	**13,73,574**	**5.17**

Source: Department of Horticulture, J&K Government, Srinagar

Recently a perceptible diversification in fruit production has been observed primarily in walnut cultivation which has a very high export potential. Walnut in-shell and in-kernel is exported to 22 countries, contributing to foreign exchange earning of about Rs. 100 crores annually which could be raised to about Rs. 500 crores annually, if the production technology is modernized, further refined and updated as per the international standards.

In temperate zone of the State further diversification of fruit cultivation with respect to crop species and varieties is in progress with the introduction of high density plantation of apples on clonal rootstocks, dry fruit raising in rain-fed areas, soft fruit crop and vegetable production like strawberry, currants and in and around cities and towns and minor fruit cultivation in fragile areas. Olive cultivation has been taken up in intermediate zone especially in district Doda. Pomegranate, filbert (hazel nut) and pecan nut cultivation have vast potential in districts of Doda and Poonch (intermediate zone). Ber, mango and citrus (kinnow) as well as vegetable cultivation has a potential in sub-tropical Jammu. Grapes have also been recently introduced in this zone but the initial heavy input requirement has been main hindrance for the farmers to take it up on commercial scale. However, better varieties suited to sub-tropical climate with less investment required for training the trees need to be tried. Low chilling varieties of peach and pear have also potential in Kashmir and parts intermediate zone viz. Udhampur, Rajouri and Poonch districts. Cold arid region excels in the production of drying type apricots. Apple and walnut cultivation is also practiced in milder areas of the region lower parts of Nubra, Leh, Kargil, Batalik and Sanjak. Grapes are also grown in lower belts of the region. Raisin grapes are grown in some parts of Ladakh (Dhahano and Batalik). Vegetables especially European types like turnip, radish, carrot, cucurbits, cauliflower and cabbage are successfully grown in areas where irrigation facilities are available. The use of poly-/green houses in fruit and vegetable production has revolutionized agriculture in the region.

Among the North-West Hill Region (NWHR) states, J&K in view of climatic suitability contributes substantially to the production of versatile temperate fruits. Other states including Himachal Pradesh, Uttaranchal and Arunachal Pradesh are far behind in production and productivity with respect to temperate fruits (Table 3). This undermines the importance and potential of production of temperate fruits in J&K. Temperate fruits in the State are grown for both domestic consumption purpose and export to other parts of the country and foreign countries. Since J&K State contributes more than 50% of production of temperate fruits in the country (around 80% of walnut production), there is much scope for increasing the production to meet the demand of growing population. For example, apple, the principle crop, accounts for more than 60-65% of area under temperate fruits. Contribution of J&K State in apple production at national level is more than 10.0 lakh tonnes. The share of this fruit in respect of area and production at national level is 5.97 and 3.54%, respectively. Table 4 gives the comparative state-wise area, production and productivity of apple in India and reveals high productivity of Kashmir soils. Similarly, J&K State contributes more than 85% of walnut production in India (Table 5). Of the 0.69 lakh hectare under walnut, more than 0.58 lakh hectare area falls in J&K State only, with production of more than 0.81 lakh tonne fruits (1998-1999 data). Other states produce just 0.20 lakh tonne walnut. Same is the case with cherry and almond. Not only the quantity-wise but also quality-wise, temperate fruits from J&K state are far better than the fruits of other states producing temperate fruits.

Table 3: Area, production and productivity of fruits in North-West Hill Region States (2002-2003 data)

State	Area (000 ha)	Production (000 t)	Productivity (t/ha)
Himachal Pradesh	165.1	480.4	2.91
J&K	219.6 (231.7)*	983.9 (1146.6)*	4.48 (4.94)*
Uttaranchal	55.6	158.1	2.84
Arunachal Pradesh	40.8	82.1	2.01

Source: National Horticulture Board, Indian Horticultural Database-2004.

**Data in parenthesis obtained from the Department of Horticulture, J&K Govt., Srinagar*

Table 4: State-wise production and productivity of apple (1998-1999 data)

State	Area (000 ha)	Production (000 t)	Productivity (t/ha)
Himachal Pradesh	83.06 (36.9)	393.6 (26.0)	4.73
J&K	86.65 (38.5)	929.0 (61.5)	10.72
Uttaranchal	55.29 (24.6)	188.7 (12.5)	3.40
Arunachal Pradesh	5.52 (neg.)	9.7 (neg.)	1.76
Other states	0.20 (neg.)	0.3 (neg.)	1.70

Figures in parentheses indicate percentage share in India; neg = negligible

Source: National Horticulture Board, Horticulture Database-2000

Table 5: State-wise production and productivity of walnut in India (1998-99 data)

State	Area (000 ha)	Production (000 t)	Productivity (t/ha)
Himachal Pradesh	4.59	5.46	1.19
J&K	58.38	81.40	1.39
Uttaranchal	16.29	9.94	0.61

Source: National Horticulture Board, Indian Horticulture Database-2000

The major vegetable crops grown in J&K prior to 1960 were confined to pea, turnip, radish, onion, Chinese cabbage, karam haak, carrot, potato, lettuce, spinach etc., so exhibited less diversification (Dar *et al.*, 2000). The vegetables were grown only in summer in Kashmir valley and Ladakh and were available for consumption only during late summer and autumn. The resident population during this period had to depend either on dried vegetables or pulses. Presently, in J&K State more than 60 vegetables crops are commercially cultivated. Further, seed production has emerged as a commercial entrepreneur. The area has great potential for cole crop seed production viz., cabbage, cauliflower, knolkhol etc.

As per APEDA estimate barely 40 ha area lies under flower production in J & K State (Singh, 1993). Though saffron cultivation is age long practice, the cultivation of hops, kalazeera, kuth, chirata, diascoria, rose, lavender, pushkarmool and artemisia has found tremendous scope in pharmaceutical industry for essential oils, alkaloids etc. in medicines, health tonics and cosmetics. Tremendous progress has been observed in increasing the area and production of cash crops like vegetables including potato, horticultural crops, as well as in soil and water conservation, forestry, indigenous plant conservation, animal and sheep husbandry.

During last 5 decades achievements in horticulture sector are quite impressive. However, this sector has not been developed to the extent of crop potential, the J&K state has. The natural resource base in the State for the development of horticulture is strong and offers tremendous opportunities. The inherent potential for horticulture in the State needs a prospective planning and analysis and setting of future targets, taking into consideration the potential, domestic and international changes as a result of the WTO, the constraints, challenges and the opportunities. The visible improvement in production and productivity in the region is as a sequel to technological advancement made during last few decades, owing to the strenuous and concerted efforts by scientists and field functionaries. The organized research efforts by research organizations like erstwhile Regional Research Station and present SK University of Agricultural Sciences & Technology (SKUAST-K and SKUAST-J), Regional Research Laboratory (RRL) and Field Research Laboratory (FRL) have lead to a significant improvement in food security and in alleviating the poverty. The present agro-ecological scenario in the various zones of the State calls for concerted efforts in developing appropriate agro-forestry, vegetable and fruit production strategies as well as preserving the rich heritage of medicinal, aromatic and others flora.

3. ECONOMIC DEPENDENCE OF STATE ON HORTICULTURE

Horticulture has made tremendous strides and significant growth during the last five decades. Though the area under fruit crops has increased 17-fold and production gone up by 65-fold yet the State is far away from other temperate fruit producing countries. The area under fruit crops has increased from 12,400 hectare in 1953-54 to 2,19,000 hectare in 2000-2001 with corresponding increase in production from 16,000 metric tonnes to 9,31,800 metric tones (Table 6). Horticulture has proved a vital economic activity in J&K State making significant contribution to the agricultural GDP. Horticulture sector generates over Rs. 1,250 crores annually, besides generation of direct and indirect employment to over 25 lakh people. The State earns more than Rs. 32 crores as toll tax from export of fruits. Walnut alone fetches foreign exchange of over Rs.100 crores. Revenue realized through toll tax of fruits in Jammu and Kashmir during the last four years has increased from Rs. 16.61 crores in 1998-99 to Rs. 27.32 crores in 2001-2002.

Table 6: Changes in horticulture area, production and productivity in J&K in last 50 years

Year	Area (ha)	Production (t)	Yield (t/ha)
1953-54	12,400	16,000	1.30
1960-61	16,000	33,000	2.06
1965-66	23,000	47,000	2.04
1970-71	48,000	1,28,000	2.66
1975-76	85,508	3,75,068	4.38
1980-81	1,31,008	5,63,028	4.29
1985-86	1,48,164	7,92,583	5.34
1990-91	1,76,297	7,69,949	4.36
1995-96	1,98,467	8,60,604	4.33
2000-01	2,19,039	9,38,100	4.28
2005-06	2,65,229	13,73,574	5.17

Source: Department of Horticulture, J&K Govt., Srinagar

There has been substantial increase in the productivity from 1.3 metric tones per ha to 4.38 metric tones since 1953-54 through 1975-76 (Table 6). However, during last 3 decades despite substantial increase in area and production under different fruits the overall productivity has shown little progress, varying between 4.38 and 5.08 metric tonnes. It seems that during these years thrust has been on increasing the area and production and less attention is paid towards productivity. The goals have not been well-defined that has given rise to unequal development of fruit cropping pattern. The fruit production profile has become dominated by apple.

The productivity of fruits in the state is very low compared to some scientifically advanced countries of the world. Traditionally temperate fruits in J&K are being cultivated mainly on marginal lands under rain fed conditions. The orchards have been established on widely spaced low-density plantation on seedling rootstocks. Such trees not only take longer time to come into bearing and record low yields of poor quality fruits, but also attain large tree size. Such large sized trees make various operations like pruning, thinning, spraying and harvesting difficult to be carried out. Such systems not only lead to low productivity but also fail to utilize resources properly.

4. EMPLOYMENT GENERATING AVENUES IN HORTICULTURE

The horticulture sector has grown up as an industry in the State. Horticulture is an employment generative entrepreneur because of being more productive and less competitive for space. It not only strengthens the nutritional security but also provides livelihood security to most rural people. The fruit crops yield more than field or vegetable crops as well as show wide agro-climatic adaptability. The refinement in production technology, packaging, processing and marketing is expected to boost employment opportunities to entrepreneurs. Further extension and diversification in horticulture crops is expected to generate more gainful employment on account of following:

➢ Fruit crop growing needs 600-800 mandays per hectare as against 150-200 mandays needed for field crop cultivation. Simultaneously, fruit crop raising shows 8-10 times more productivity than field crops.

- Horticulture crop cultivation has enormous scope for horizontal expansion by bringing wastelands and drylands under orchards.
- Fruits, vegetables, plantation crops etc. need post-harvest processing so has much scope for value addition, agri-business and employment generation. The opportunities for employment through adoption of advanced grading and packing system, post harvest handling activities and transportation is expected to increase. For example, the estimated manpower requirement for fruit processing industry is one person per tonne per year.
- Adoption of advanced technologies like high density plantation and polyhouse technology etc. is expected to boost the quality plant production leading to the employment generation in public/private nurseries.

5. CONSTRAINTS IN HORTICULTURE DEVELOPMENT

Despite the development of strong base in horticulture, the sector faces various constraints in vertical and horizontal expansion which are briefly discussed below:

i. Resource constraints

The J&K State has enormous natural resources in terms of land and water. But unplanned conversion of fertile soils to unproductive sector has adversely affected future prospects of horticulture development as it takes almost a decade for a fruit crop to reach gainful bearing. Even established orchards are cut for constructions purpose etc. which needs legal ban as it has led to the fast depletion of land resources.

Western Himalayan region has ample water available in the form of numerous rivers and river-lets flowing throughout the State. However, water conveyance, delivery and use for irrigation over long stretched barren, plateau and gentle slopes poses serious limitations. Delivery and conveyance of available water through pilot irrigation projects or by generation of substantial energy for lift irrigation system involves heavy investment and sophisticated engineering technology. Non-judicious water management practices followed is another major hurdle in horticulture development leading to the serious moisture stress at critical stages of plant growth and fruit development (June to August). Efficient water-use technology, proper watershed management and soil conservation measures have enormous scope in reclaimed wastelands and unarable lands for diversified production system like silvi-horti-pastoral or silvi-horticulture with vegetables or saffron or medicinal/ aromatic plant as inter-crop to uplift socioeconomic scenario of these areas. Water harvesting and water management practices adopted in horticulture need further refinement and improvement. Orchards in Kerwas which support a substantial plantation of fruit trees lack irrigation facilities so crops suffer heavily during insufficient rainfall years.

Preserving the sustainability of lands for consistent productivity is much desired in the State. Areas with assured irrigation facilities could be satisfactorily utilized to its maximum through adoption of fruit and vegetable cultivation on large scale alone or in mixed farming. In J&K state crop area expansion and diversification is confined to those areas where no natural resource constraint exists or to newly developed command areas. Development of appropriate horti-pastoral approach under inter-cropping system, evolution and adoption of improved technologies for existing fruit growing belts and replacement of inferior orchards with superior and high yielding cultivars are some of the issues requiring urgent attention. The excessive and unsystematic exploitation of natural resources without adequate replenishment has accelerated damages to the natural environment thereby threatened the delicate eco-balance. Horticulture development needs special emphasis as it has enormous potential in the region for making effective wasteland use and resource conservation to accelerate the socio-economic upliftment of the people.

Soil classification and fertility mapping of all the regions; determination of optimum requirement of water and nutrients etc. for different fruit/ vegetable/ floriculture/medicinal and aromatic plants grown in the State; and documentation of location specific agro-meteorological data is lacking.

ii. Material constraints

Lack of superior true to type certified planting materials having high productivity attributes and free from viral and other biotic stresses is an impediment in enhancing production. There is no organized system in place to produce large quantity of virus free planting material. The State has narrow spectrum of improved varieties with quality of higher productivity and potential for maturing early. The apple from Himachal Pradesh and Utranchal matures earlier and reach market earlier so fetches better returns to the orchardists. Early maturing varieties, barring a few, which could reach terminal markets earlier are not available in the State. Further, the State requires large quantity of planting material for area expansion, renovation and rejuvenation of old orchards. No recognized mother orchards or bud wood banks are available which could cater to the needs of growers. The plantations made in orchards is not properly trained and pruned on the basis of requirements viz. kind, variety, location, density, fruiting habit and behavior. General type of pruning and training framework is followed without caring for the fruit behaviour.

iii. Fertility management constraints

Little attention paid to ascertain the fertility status of orchard soils. The chemical fertilizers especially nitrogen and phosphorus are applied indiscriminately without having soils properly tested. The organic matter content of most orchard soils have gone very low as no serious efforts are made to improve build up of their health status. There is no clear-cut policy to improve soil health status through organic resources.

iv. Manpower constraints

The inadequate trained human resource in this specialized sector has slowed down the process of further expansion of horticulture. Moreover, scarcity of skilled and unskilled labour at critical periods makes intensive cultivation more difficult due to high labour costs at peak periods..

v. Socio-economic/Land holding constraints

Average size of land holdings of fruit growers in the State is less than one hectare and about 80% farmers are marginal farmers which increases the cost of production of fruit per unit area. Further, due to difficult terrain in some areas of the State, cultural and post harvest operations cannot be fully mechanized.

vi. Production constraints

The factors responsible for low production and productivity in the State are monoculture, lack of standard cultivars, high variability of plant material (root and scion stocks), poor quality plants, low density plantation, inadequate placement of pollinisers and pollinators (apiary) in orchards etc. Inadequate pollination and fertilization often results in crop failure and yield decline. Poor management practices include improper training and pruning, poor nutrition status, improper disease and pest management and wrong post harvest handling and storage.

vii. Insurance/credit facility constraints

Lack of loan/ credit facilities in remote rural areas for taking up horticulture enterprise is one of the impediment for successful fruit cultivation as low income group growers fall easy prey to middlemen and brokers. Crop insurance schemes are not in operation to obviate the risks involved.

viii. Constraints in crop improvement

Unfortunately the rich germplasm in fruit and vegetables in the State is dwindling due to the natural vagaries and unplanned anthropogenic activities leading to habitat destruction and loss of rare species. Consequently the plant wealth in the State is faced with the onslaught of ecological crisis and grave economic stress. The Ambri apple, for instance, is lost at very fast rate. Strenuous efforts are required to improve crop varietal base. Most of the orchards are more than 40 years old and unplanned which need to be rejuvenated. Older and bigger trees yield less per unit area as well as exhibit replant problem.

ix. Lack of environmental awareness

Environmental awareness among the masses requires active support and participation of people dwelling in and around the orchard areas. The local involvement in conservation programmes such as planning, policy-decision process and management of all resources for sustainable production etc. is presently meager. Indiscriminate and unplanned fruit plantation of unknown rootstock on traditional paddy lands has lead to some serious production problems which may have lethal consequences to the fruit industry.

x. Post-harvest limitations

India produces about 45.9 million tonnes of fruits and 81.9 million tonnes of vegetables but 20-30% is lost due to the post-harvest damages. There is very little information available regarding an efficient maturity index of various commercially important varieties and their storage behaviour. The non-adoption of proper maturity standards of fruits harvest show adverse repercussions during their post-harvest handling, storage and marketing, both in fresh and processed products. Poor marketing facilities and poor shelf life of horticultural produce, especially apple, apricot, cherry and plum has given flip to value added product preparation in the State but no proper takers of the product are available. Only 10% of fruits are processed which provokes the growers to dispatch lower grade fruits with superior grade fruits.

xi. Infrastructural constraints

State is located far away from the terminal market of the country as compared to HP or Uttaranchal. This increases the transportation charges. The road and communication, infrastructure in poor shape and cold stores, CA stores or cold chain, ware-houses etc. for maintaining and preservation of quality of fruit is not available to regulate the supplies.

xii. Technological constraints

A lot of advanced technology suitable for the three regions of the State has been developed through research activities of SKUAST (Kashmir and Jammu), CITH, RRL and FRL which needs to be taken up on full scale. Some of the technological constraints in enhancement of crop production are non-availability of quality seed of high yielding varieties; poor quality of planting material; lack of proper rootstock; inadequate placement of polonizers in orchards; poor soil nutrient management; improper training and pruning; inadequate plant material through progeny orchards; poor agro-horticultural techniques; lack of reliable maturity standards; poor orchard site management due to sloppy nature of orchard floors and lack of infrastructure facilities for post-harvest handling of produce, particularly in the areas of grading, packaging, storage and transport. Moreover, the modern sophisticated facilities such as cold storage ware houses, refrigerated trucks and proper packing system etc. are almost non-existent. Most flower and vegetable produce are packed in gunny bags/ baskets or leaves. Similarly, most aromatic and medicinal plant cultivated on large scale are based on introduced species, tailored to low input conditions. These crops received little concerted research support for genetic improvement.

xiii. Marketing constraints

The marketing of fruit is not properly organized. Market information system in the State is poor. There is no proper regulation of marketing horticulture produce in the State which often results in glut and low returns to the growers. In the absence of proper marketing system and infrastructure required for post harvest management, post harvest losses are very high. The production, collection and trade in horticulture is somewhat disorganized and exploitative so fetches less remunerative prices to the growers. Transport of perishable horticulture produce from remote areas to major business centers and regulated marketing is an uphill task for cultivators. Similarly, lack of infrastructure for post-harvest management, weak cooperative quality control system and unregulated supply of produce to main market are the problems requiring urgent focus.

xiv. Disease and pest constraints

The disease and insect menace is one of the major limitations in popularization of horticulture in the whole Western Himalaya. About 20-25% produce is damaged due to pest and diseases in Himalayan region. The seedlings and rootstocks are more susceptible to biotic and abiotic stresses. Codling moth alone causes a damage upto 44% in apple in Ladakh region. Majority of the apple cultivars grown in the State (50-60%) is from sweet and delicious group which is more sensitive to biotic and abiotic stresses, besides showing acute biennial bearing tendency. Biotic and biotic stresses including drought like situation and pests and diseases are responsible for reducing the yield and quality produce. The lack of proper integrated sustainable crop protection and nutrient management strategies has hampered the production of fruit and vegetable crops. Excessive and indiscriminate use of pesticides against pests and diseases besides inducing resistance to pesticides, have also increased the dimensions of environmental problems and health hazards.

xv. Extension-linkage constraints

The extension network in the State is poor and the field functionaries are not adequately equipped with the facilities to reach remote and scattered orchards which have hindered effective technology transfer. The use of information technology in the dissemination of technical know-how generated is still in infancy.

xvi. Planning constraints

Proper management and efficient utilization of available resources requires better understanding and co-ordination among various departments. Lack of participation of subject matter specialists addressing a particular problem in plan formulation and execution makes planning process least effective.

xvii. Financial constraints

Most of the farmers in the region possess marginal land holdings and have limited financial resources for adoption of improved land management technologies. The initial investments on establishing a new orchard are very high which include layout, digging, pit refilling, fertilizers and pesticides, pruning and training, orchard fencing etc. Liberal loan facility at low interest rates are desired for new orchard establishment as the persons entering this venture are mostly marginal land holders. In horticulture-based land use system the problem gets more aggravated because of high establishment costs for establishing new orchards. Long term loans with lower interest rates could pave way for popularization of more remunerative horticulture-based integrated system. Agro-based industries, varietal development programmes, farm implements and other machineries are required to improve horticulture scenario in State.

6. FUTURE STRATEGIES FOR HORTICULTURE DEVELOPMENT

J&K State is endowed with unique advantage of having rich natural resources and diverse agro-climate and has vast potential for a variety of temperate fruit raising including apple, pear, apricot, cherry, walnut, almond, plum, strawberry etc. and sub-tropical fruit cultivation including mango, ber, kinnow, pomegranate, grapes, olive, loquat, jaman, phalsa, litchi etc. With this rich natural resource diversity, in terms of land, climate and biodiversity, the opportunities of further diversification of crops and varieties are more than in any other State of Western Himalaya. There are ample opportunities for having diversified crop mix. If properly planned, such type of diversity will greatly reduce the risks involved in fruit production. Based on the developments in horticulture, appraisal and analysis of various programmes implemented and research outcome, the future strategies for horticulture may be comprehended as under:

i. Identification of core areas for horticulture development

Site- and eco-specific crops need to be identified and classified before modeling different areas for their suitability to different fruit and vegetable crop species. Priority is to be given to the identification of potential areas for horticulture expansion, crop diversification and zonalization. In these core areas horizontal expansion of horticulture in diversified manner can be undertaken on modern scientific line under the strict vigil of development departments. Agro-Export Zones for apple, walnut, almond, cherry and apricot need to be developed to ensure production of quality fruit, capable for competing international standards.

ii. Establishment of model nurseries cum orchards

Seeds and planting materials are crucial for the development of horticulture. A healthy nursery is foundation for an orchard and adequate quantity of superior quality plant materials is essential for fruit industry. The nurseries help to meet the fruit plant requirement of specific block/area as well as serve as demonstration labs for cater training to the progressive growers interested in horticulture enterprize. In such model orchard cum nurseries modern tested innovative technologies may be followed stringently. These model nurseries and orchards can also serve as working guides for luring the progressive growers to take up horticulture as most beneficial enterprise.

iii. Conservation of indigenous genetic resources

For successful crop improvement an appraisal of indigenous cultivars/

varieties/land races is essential prior to the decision of introducing exotic varieties. Therefore, survey, collection, identification, evaluation and conservation of indigenous descript and undescript cultivars/strains of fruit and vegetable crops and maintenance of their data bank is pre-requisite. The suitable indigenous rootstocks acclimatized to different environment-stress conditions viz., low moisture, temperature fluctuation, poor nutrient etc. need to be identified for future research. Planting poor quality low yielding plant material is often responsible for low quality fruit production. This can be rectified by identifying, selecting and propagating high quality high yielding elite trees and their perpetuation through propagation in public and registered private nurseries in a scientific manner. These promising types of known merits when managed scientifically will serve as gene banks and would substantially increase the quality of fruits. Kashmir is famous for Ambri apple, indigenous to valley, which has par excellent characters like aroma, sweetness and high keeping quality. The area under this variety is dwindling so a programme for improving this variety with respect to low juice content, corky pulp, biennial bearing behaviour and long gestation period is required to make the variety more palatable to growers and consumers.

iv. Introduction of high yielding varieties

Besides local gene-pool conservation and evaluation there is pent up need to introduce exotic potential varieties and develop high yielding horticulture crop varieties/ hybrids having specific desirable attributes (e.g. pest or drought resistant) on modern lines. Before introducing such varieties their rigorous screening and proper testing under the supervision of experts is pre-requisite. The introduction of superior and more productive cultivars of almond, pear, walnut, pecan nut, peach, plum, strawberry, apple, cherry, pistachio, hops, kalazeera, quince, saffron etc. needs testing in suitable double-cropped areas to widen cultivar base. Care needs to be taken for the susceptibility of introduced cultivars/ varieties to local strains of insect pests and pathogens. Diversification in fruit crops like pear, cherry, peach, apricot, apple, plum, quince, hops, almond, walnut, pecan, pistachio, strawberry, seabuckthorn, cole vegetables etc., which have greater potential and vast market within and outside the State need to be promoted.

v. Breeding new varieties

The identified and evaluated promising varieties may be grafted or budded on local root-stock as ample opportunities exist for combining the characteristics of available genetic stock into varieties with desirable attributes. The focus of horticulture breeding programmes must be set on evolving plants with compact growth habit and high yield attributes; better fruit quality; cold tolerance/ hardiness attribute; moisture stress surviving, drought-escape potential; induce precocity and regular bearing; develop suitable pollinizing cultivars; evolve varieties having soil binding properties; evolve varieties having low nutrient and water requirement; develop disease and pest resistance/tolerance; improved market and processing suitability viz. prolonged post-harvest storage attributes; develop cultivars with high shell out percentage, sweet drying type and thin shelled in case of nut fruits; inculcating thermo-insensitivity in varieties; and evolving short growth duration varieties. Clonal selection of existing varieties and development of quality rootstocks is the need of hour to overcome narrow varietal base. For instance, dwarf shoot stocks M_9 and M_{26} have been recommended for irrigated and MM_{111} for moisture stressed orchards.

vi. Standardization of propagation techniques

Standardization and refinement of propagation techniques and timing of budding and grafting under a particular agro-climatic sub-zone is essential to prevent reported failures. The problems of long gestation and uneven produce need to be addressed through proper technology development. The work needs to be taken on innovative lines to short gestation period as has been done in walnut by hot cable callusing (HCC) technique developed by SKUAST-K. The apple of Kashmir compares well with the best fruit grown anywhere in the world, but the production conforming to international specification is often less than 20% as compared to 50% in advanced countries. These countries have achieved this goal through plantation of selected spur-type cultivars (apple) of known quality stocks that are precocious in nature and bear fruit of standard colour having uniform size. The newly released cultivars of almond HS-2 (Makhdoom), HS-8 (Parbat), HS-9 (Waris) and HS-10 (Shalimar) and those of walnut (WS-16 and WS-23) and apple {Shereen, Firdous) and scab resistant

Priscilla cultivar may be planted for their better attributes. Seedling stocks raised from single tree fruit seeds having vigorous characters and resistant to biotic and abiotic stress have been recommended for rainfed areas and similarly propagation techniques standardized for hard wood species like nut crops may be followed.

vii. Rejuvenation of non-commercial orchards and high density plantation

The non-commercial orchards need to be rejuvenated on modern scientific lines and cured through proper management, if possible. The existing wild/ indigenous inferior quality materials such as bitter kernelled nut crops (almond, apricot etc) and non-commercial varieties of apple etc. may be top worked and efforts in these direction be geared up. High density plantation (HDP) concept is feasible to the areas having assured irrigation. The HDP accommodates seven times more plants/unit area than conventional plantation and plant canopy size is also less and manageable. The loss of plant nutrient and water is less in HDP. The high density plantation of apple, walnut etc. gives higher gains per input involved. Therefore, future course while rejuvenating or replacing older plant should to plant HDP having good quality precious commercial varieties in the areas of assured irrigation.

viii. Protected cultivation

Green house technology has found application in early raising of vegetables and nursery fruit plants etc. The technology has been standardized and further refinement is possible to have maximum gains on locality-basis by working out the strategies for determining the optimum period for raising seedling; protecting the new introductions during initial varietal screening; extending growth period of crops requiring medium duration periods (5-7 months); popularizing vegetable seed production particularly cole crops; growing off-season vegetables and flowers; hastening the process of sun drying with improved hygienic attributes etc.; utilization of less land for more production; saving inputs like irrigation, labour etc., growing selected quality fruit, vegetable and flower seedlings/ cuttings well in advance of the normal season for transplantation. In cold arid vegetable crops are grown advantageously in off-seasons during fall, winter and spring (Dar and Wani, 2007). Different types of solar-based greenhouse structures viz., glasshouse, poly-greenhouse, underground greenhouse (poly-covered trenches), low poly/ fibre glass tunnel, fibre reinforced polyester greenhouse, polyench greenhouse, polycarbonate greenhouse etc. have been devised and evaluated in different zones of the State. Based on the concept of intensive agriculture the technology permits maximum photoactive radiations for effective photosynthesis and help in maintaining the congenial/ ambient microclimate for plant growth.

ix. Proper management practices

Orchard management is a highly skilled job and needs whole time devotion of trained growers. Correct and timely operations are best insurance for raising high quality fruits. Presently orchards are managed on obsolete conventional lines. As such there is urgent need to expose fruit growers to modern orchard management practices in an organized manner so that proper technological approaches in raising and maintaining orchards are followed which include proper management of orchards floor to suppress weed, suckers and wild growth; intercropping with short duration leguminous forage or adopting clean cultivation especially under dry conditions; timely application of adequate manures and balanced fertilizers as per fertility requirements determined through soil and foliar analyses; proper training and pruning based on kind, cultivar and location; chemical/hand thinning of fruits to allow optimum crop load uniformly distributed on trees to overcome biennial/irregular bearing behavior; adoption of timely plant protection measures against insects and diseases; maintenance of proper orchard sanitation and surface drainage; harvesting the fruits at proper maturity stage and careful post harvest handling for prolonging shelf life and quality for value addition (Qureshi, 2000). The management problems need to be addressed through horticulture technology mission.

x. Horticulture production programmes

Various production problems faced by the fruit growers include low production and productivity, poor quality, poor management practices, inadequate pollinizers in orchards and non-diversification. Per unit production of apple, for instance, in J&K is highest among the apple producing states of the country and has shown steady increase during last decade, yet it stands far below the level of advanced countries where a production per ha 4-6 times more. Under temperate climate conditions there is possibility of at least doubling the produce provided appropriate technology is adopted.

xi. Regulation of input requirement

The productivity of temperate fruits grown in J&K State is much higher than other states cultivating the same fruit crops. In fact the average yield of apple in district Baramulla is 2-fold than State average. With the adoption of modern and innovative technologies the prospects of increasing the productivity of fruits in the state are very high. The flat or slight gradient lands have good potential for high density plantation, which besides increasing productivity will also increase employment opportunities and ensure judicious use of inputs. Timely supply, availability and delivery of inputs like plant/ seedling material, fertilizers, pesticides etc. can be ensured only when the concerned departments formulate and execute plans well in advance to meet their anticipatory requirements. The use of modern engineering tools and implements need to be encouraged to reduce much dependence on labour and improve the work efficiency for which concerned institutions have to come forward.

xii. Development of appropriate package of practice

There is need for the refinement and tuning of package of practice for different fruit and vegetable crop in accordance to the agro-climatic and soil testing basis for various sub-zones in the J&K State. Massive programme for plantation of walnut, almond, apricot etc. in far-flung areas has to be launched to take advantages of their high value and less post-harvest management problems. Proper plant spacing, photosynthetically efficient canopy structures and micro- and macro-nutrient requirements need to be worked out.

xiii. Seed production as an enterprise

The nature has bestowed the state with peculiar agro-climatic conditions suiting seed production of various vegetable crops especially cole crops and virus-free potato not possible in other areas of the country. This eneterprize has already taken agri-business shape and needs further strengthening due its high returns.

xiv. Plant protection technology

Insect pests and diseases substantially reduce horticulture and vegetable production. Though some apparently resistant varieties in some fruit crops have been developed yet we rely on integrated pest and disease management programmes to avoid economic losses. The incidence of serious disease and insects especially apple scab, Alternaria leaf blight, San Jose scale, red mite etc. plays an important role in reducing the quality of our fruit. Basic information on disease status, perpetuation and dispersal means of pathogen etc. need to be generated for specific control measures. Strict quarantine measures in respect of some specific disease and pests have been enforced at all entry points in the State. The technological know-how and updated spray schedules for disease and pest management have been standardized but need timely and proper adoption. This shall prove helpful in restricting and combating these menaces to reasonable limits. Recommended integrated pest management (IPM) against mites, sanjose scale and codling moth need to be taken up for control of these menaces. Further, the Red Gold and Golden Delicious cultivars of apple were found to harbour low population of mites as well as MM-series of apple root stock were found free from wooly aphid compared to M-series. The Use of quality pesticides must be ensured in view of spurious materials available in market nowadays. Government also needs to gear up to punish trades involved in supply of spurious pesticides. Simultaneously keeping in view the hazardous and ill-effects of pesticide use, thrust is to laid in developing ecofriendly sustainable integrated management schedules.

xv. Biotech-approaches for modernization of horticulture

Plant biotechnology is noval and faster approach for developing the cultivars with desired attributes in short span of time. The biotechnology has found application in plant propagation, improvement and protection of vast genetic resource and *in vitro* strategies. The techniques of plant cell and tissue culture and molecular biology research on the use of cloning technology to improve plant resistance to biotic and abiotic stress, reducing post-harvest losses, shortening research and development lag and improving product quality hold are some arena, which need focus. The research may be initiated by agricultural universities/ research institutions on the lines conducted in other temperate and subtropical ecoregions so that dependence on time-consuming conventional breeding and plant protection programmes is minimized. There is need for developing protocols for bulk production of seeds/ plant materials through biotechnological means in crops where seed production is poor or negligible.

xvi. Soil and water conservation

The research and extension programs must address indigenous systems with a focus on the human dimension; methods for appraisal of water harvesting sites, optimization of the use of harvested water and dissemination of new technologies to land users. Maintenance of soil health is a pre-requisite to harness better crop returns. The strategies to conserve soil and reduce erosion losses due to water and wind are to be devised keeping in view the less nutrient exhaustive, sustainable, ecofriendly and eco-specific cropping patterns. Soil moisture conservation, water harvesting and water recycling are some of the mechanisms by which wastelands can be converted into arable areas and their inherit soil potential exploited into efficient productivity. Soil and moisture conservation measures like contour farming, terracing, terracing, shelter belt plantation, mulching, organic recycling etc. need to be followed carefully through command area development schemes. Mulching with organics, polythene, transparent plastic, gunny bags etc. and use of evapo-transpiration retardants have been found effective in reducing the loss of soil moisture. The J&K State has scope for integrated planning for soil-water-crop-livestock management on scientific basis and ecological sustenance. Proper silvi-pastoral/ horti-pastoral resource-use is desired to achieve niche diversification. The use of top fertile soil for brick making needs to be banned to save future generations. The involvement of locals in all conservation programmes needs encouragement to be result-oriented.

xvii. Watershed management

The demand for irrigation water is set to increase manifold in next two decades. Presently surface runoff and stream water is collected through water harvesting technology in storage tanks/ farm ponds and then recycled as and when required by the forests/ horticulture crop systems as life saving or supplementary irrigation. Adoption of modern water harvesting and watershed management techniques may be strengthened and taken up in drought-prone areas of the State. The surface and sub-surface water potential of any new area proposed to be taken under horticulture programme is first to be assessed and proper integrated watershed management programmes developed, particularly for Kerewas (uplands). Further, most suitable vegetative-engineering combinations for controlling sheet/ gully/ rill erosion and regulation of surface runoff in natural drains on upper, middle and lower reaches of watersheds in different agro-climatic zones needs to be followed meticulously.

xviii. Judicious/optimum water use

The judicious and economic use of water is of paramount importance for sustainable food security. The adoption of efficient irrigation methods may save about 30% water in surface irrigation whereas advanced methods of irrigation like drip and sprinkler irrigation etc can save 30-60% water with 30-50% gain in yield. Sprinkler and drip irrigation which work on the principle of gravity may be tested in apricot, apple and other fruit and vegetable crops for judicious water use. These micro-irrigation measures ensure slow and regulated flow of water and nutrients directly to the root zone of a plant as per its requirement. Moreover, these measures ensure maintenance of moisture content in root zone close to the field capacity. The soil conservation measures like terracing, bunding, leveling of sloppy lands and contour farming minimize the losses of surface runoff and soil nutrients and are of great significance in horticulture development in new command areas. Ground water resources also need to be used judiciously lest we may face the problems now experienced by Punjab and Haryana. Attention needs to be focused on imparting training to farmers on efficient water management so that they become aware of the latest innovative technologies in soil and water conservation.

xix. Sustainable nutrient and pest management

Crop losses due to pathogens, insects and weeds are 20-33%. Therefore, the use of chemical fertilizers and pesticides is inevitable in crop raising for optimum gains. The escalating costs and adverse ecological effects limit their use in this tourist State. The persistent use of pesticides not only damages soil structure and surrounding environment but are also hazardous to man. Therefore, use of farm yard manure, night soil, compost, green manuring and recycling organic wastes in soil seem vital particularly in Kerewa for sustained soil productivity. Nutrient cycling through crop residue management is pre-requisite for sustainable fruit production. Farm residues and culled fruits could be recycled through appropriate on-farm composting technology. Since chemical use adversely affects soil microbial biomass and deteriorate ecosystem, therefore thrust is to be laid on alternative sustainable agro-ecosystem and eco-friendly measures such as use of botanical and microbial-based pesticides. This shall help in tilting the narrow ecological balance in favour of better soil health.

xx. Inter-cropping/mixed farming system

Horti-pastoral system need to be extended to compact orchards developed in new command areas. Intercropping of red and white clovers or saffron may be taken up in assured irrigated orchards whereas for rain-fed orchards maintenance of clean orchard floor is suitable. Legumes and certain vegetables may also fit in agri-horticultural systems under temperate conditions. Development of appropriate agri-hortcultural system for different belts is required to have self sustained system producing fruit, food and fuel for poor besides maintaining ecological balance and soil fertility. Keeping 5-6 apiaries in one hectare orchard at flowering stage helps in better pollination in cross pollinated crops. Use of suitable pollinator such as *Aphis cerana, A. indica, A.lassioglosum* and *xylacopov vulga* in case of almond and other nut crops may be followed (Sofi, 2003).

xxi. Value addition and agro-business potential

Various agro-based technologies find application and potential for development of need-based quality products. Low cost preservation technology not only minimizes post harvest loss but also help in the conversion of fresh fruit into value added products. The utilization of surplus produce for value addition through post-harvest processing offers young entrepreneurs ample avenues which include mushroom cultivation technology, apiculture rearing, post-harvest value addition of produce, oil extraction, waste bioconversion to quality manure and fertilizers etc. A meager quantity of nut kernels and roses etc. is presently being utilized for.oil extraction. Development of agro-techniques for extraction of high valued essential oils, alkaloids, aroma and pharmaceutical components is also desired which shall include the setting up of essential oil/ aroma extraction processing units in rural areas, evaluation of minor oils and generation of quality standards of commercially important essential oils, fragrance, flavour etc. For extraction of essential oils from horticulture produce like apricot and olive stone decorticator-cum-oil extractor developed by RRL, Jammu is used by growers on limited scale. Establishment of agribusiness ventures and centers of post harvest training at remote corners of the State need to be explored which shall help in avoiding the persistent marketing constraint. The national banks, especially J&K Bank, Agricultural and Processed Food Products Export Development Authority (APEDA) and National Horticultural Development Board (NHDB) and other agencies have to come forward for liberal loans to develop horticulture processing units.

xxii. Diversification in horticulture

The diversification in horticulture crops in an orchard at genus, species and varietal level shall make it more remunerative and avoid glut flow of produce at critical periods. The multi-fruit crop orchards are easy to manage and also avoid the adverse effects of monoculture. Most commercial apple varieties need proper pollinizers in their vicinity which too can be overcome by following diversification strategy (Masoodi, 2003). Further, the produce can be had throughout the season. Unplanned proliferation of apple cultivation only in the State has resulted in over production of low quality apple fruits causing glut in markets with consequent reduction in its value. The diversification in orchards can be achieved by introduction of exotic spur-type apple cultivars and creating their special belts/areas; adopting scientific management of apple trees from pre-bloom to harvest stage; promotion of standard sweet cherry cultivars around cities and towns for export to cosmopolitan cities in the country and abroad, bringing more areas (uplands) under high value crops like almond and walnut of standard quality; establishing walnut dehulling and handling practices in production areas; establishing processing units at small and medium scale in fruit growing zones for low grade fruits; establishing more apple concentrate plants in main producing areas for value addition; promoting high value and low volume crop cultivation viz., strawberry, currants, mushroom, peaches, plums, prunes and asparagus, saffron, zeera, seabuckthorn etc.; promotion of seed industry of European type of vegetable, especially hybrid seeds; promotion of cultivation of ornamental/aromatic plants, bushes and cut-flowers and promotion of cultivation of medicinal and industry oriented plantation.

xxiii. Standardization of maturity indices and on-farm storage

Development of standards for maturity and picking of fruits as per the aim of product_utility needs attention alongwith the creation of advanced technology for on-farm storage facilities. Emphasis is also to be laid on establishing a cold chain to enable fresh produce (fruits, vegetables and flowers) to reach distant mandies of the country with minimum quality deterioration as well as secure better returns.

xxiv. Preservation and processing of horticulture produce

The J&K State has monopoly in quality fruit production in walnut, apple and cherry. Potential and prospects of quality fruit export in J&K is high, if adequate measures to produce quality fruit and improve post harvest management are taken. Carriage charges and inaccessibility of fruit growing areas has lead to the wastage of farm produce. Preservation and post-harvest processing of surplus fruit into various value added products viz. apple jam, fruit jelly, mango squash, tomato soup, osmosed dry apricot, vegetable pickle, fruit nectar, ketchup, papads, snacks ready to serve (RTS), toffee, candies, chutney etc. The post harvest management standards in the State are far below the required level. The technology of preservation, prolonging shelf life, storage and processing of fruits and vegetables needs upgradation if fruit processing industry has to gain strong footing. For instance, post-harvest processing of apricot through sulphitation and use of tent type solar drying with white or black polythene have been found effective in reducing the drying periods of apricot in cold arid from 22-25 days to 4 days and prolonging shelf life. Similarly, manual nut dehulling operations could be made easier by post-harvest dip of walnut and almond in 4500 and 500 ppm ethephon for 1-2 minutes, respectively. Technology for dehulling of walnuts has been developed and involves ethaphon spray @ 2000 ppm at PTB stage or dipping of harvested walnut to achieve better returns.

Adequate post-harvest infra-structure for processing of surplus and unmarketable fruits would reduce high transit loss. Value added export based on competitiveness, efficiency and consciousness need strengthening. Floriculture in the State has enough scope for expansion especially with respect to cut flower, lavender and rose production. Post-harvest technologies for value addition of flower, medicinal and aromatic plants viz. stage of umbel/ flower/ rhizome harvest, seed separation, drying, proper grading, sorting, packaging and storage standards as well as extraction of high valued essential oils/ medicines as an alternative viable business in this part of the country. Further, establishment of a chain of spawn production and training units, canning centres, dehydration facilities and pasteurization chambers for pasteurized compost preparation and casing materials for mushroom cultivation are required.

Processing by dehydration, fermentation and sun drying are practized at household level. The culled fruits are used to prepare concentrates as well as in salads, snacks, jams, jelly, pickle, juice and cider. Jam, nectar, candy bar, papad etc. are prepared from various produces. Improved packaging plays an important role in protecting the quality of these commodities and extending their marketability potential to the advantage of growers and traders. A wide range of packaging materials like gunny bags, baskets, wooden crates etc. are used for marketing fresh produce which often results in mechanical damage and heavy loses.

Demand for packing boxes has caused acute shortage of suitable timber thereby escalating its costs to uneconomic levels. This warrants use of cardboard boxes as alternative for packing boxes An important reasons for poor returns to growers is non-adoption of grading standards and malpractice of topping, while packing fruit for different markets. Adopting uniform grading standards for all apple growing states for common varieties and their strict enforcement in packing houses and terminal markets is need of the hour. There is need for building of low-cost on-farm storage facilities for pre-cooling and storage on reasonable charges; cold/controlled atmosphere storage facilities for quality fruit production centers, substitution of present packing material (wooden boxes) with card board boxes and improvement in transportation system/refrigerated transport for superior apple and soft fruits.

xxv. Market management and risk coverage

The fruit marketing costs have increased tremendously during last decade without matching increase in their returns. Marketing costs can be minimized by proper technology adoption like strengthening market intelligence, post-bloom pre-harvest forecasting of fruit yields; establishing rural fruit markets; packing superior grade fruits only for outside mandies; adhering to stringent grading standards; expanding and improving market network within and outside the country; training of manpower in post harvest handling and marketing etc. The market intelligence supported by appropriate fruit produce carriage system and information technology help in the regulation of supplies and assured remunerative marketing. Examination of commodity-wise marketing costs, margins, price-spread and marketing efficiency and involvement of marketing agencies in regulating commodity markets are required to make horticulture a sustainable enterprise. The inherent poor road linkage is a big hurdle in speedy horticulture development. So development of on-farm storage structures and marketing facilities will provide boost to small holders to markets. Risk management warrants, devising suitable crop insurance schemes covering all the major horticultural crops grown in the region, minimum support price as done in case of wheat, sugarcane, rice etc. in other State and developing system for accrediting the agencies for assuring quality warrant immediate attention of Government.

New fruit markets within and outside the country have to be explored to ensure sound distribution of fruits. Sale of fruits should be encouraged in production areas itself. This, besides giving confidence to growers, handling agents in the disposal of their fruit, will also regulate the flow of the fruit to distant markets in an organized manner. Further, scientific methods like computerization, use of e-mail and fax facilities should be adopted in sale of fruits in the markets rather than using obsolete conventional methods.

xxvi. Strong research-extension base

To raise standard quality fruits for state, national and internationa markets, research programmes have/ are being pursued by trained, experience scientists/ technologists at the research institutions. The State has sound an organized institutional R&D support in form of SK University of Agricultura Sciences & Technology, Kashmir and Jammu, Central Institute of Temperat Horticulture (CITH), Regional Research Laboratory (RRL), Field Research Laboratory (FRL) etc. for developing innovative technologies to help the farmers to improve productivity and produce quality fruits, extending technological support for solving production and post production problems and provide technical support. The Departments of Horticulture, Horticultural Planning and Marketing and Horticulture Produce and Marketing Corporation (HPMC) assist the farmers to produce quality fruit, ensure better marketing and also in value addition. The research programmes are taken up on the basis of feed back received from orchardists and state extension agencies. Proper linkage between researcher and intended client and minimizing the gap between lab and land through extension functionaries helps in improving technological acceptability and outcome. The strategy to accelerate horticulture development through proper mix of technology and organizational policy reforms is desired. For effective technology transfer and assured remunerative marketing panchayats and NGO's have to participate in public-private sector partnerships. Information technology sector has key role in connecting researchers with ordinary farmers, lessening the distance and preparing the mindset of farmers for the adoption of new technologies, therefore, stress is to be laid on strengthening this sector to tap its benefits for growers is stressed. The involvement of information technology in dissemination of technologies generated and providing market access also needs to be strengthened.

xxvii. Development of integrated regional models

Cohesive functioning of development departments on the suggestions given by technical experts make the execution of plans effective. Planning departments have to identifying the priorities, define the specific targets and encourage the monitoring of short falls/ achievements on rational basis. Moreover, collaboration between government-industry-grower-marketers-traders in formulation and regulation of production policies is desired. Regional models ought to be developed that integrate fruit culture with vegetable/field crop production, agroforestry, silviculture pasture development, energy plantation, animal husbandry, agri-engineering and soil-water conservation for sustained production on arable and non-arable lands.

xxviii. Modernization of indigenous technical know-how

Indigenous technical know-how is a valuable asset developed after age-long experience and observation. These technologies need upgradation and proper support in accordance to the modern scientific developments taking place across the globe. The patenting and biopiracy of valuable technologies, rare plants and herbs and local products is going on all around the globe and the indigenous wealth and knowledge existing in the State should not go like *Basmati*.

xxix. Human resource development

To excel and strengthen human resource development in horticulture sector specialized training programmes at diploma, under-graduate and post-graduate level need to be instituted by developing separate faculties of 'Horticulture' and 'Post harvest Engineering and Bio-processing' at the institutions imparting trainings in agriculture field. These faculties will facilitate in providing strong human resource base for horticulture expansion.

"Kashmir Speaks", I am told, proposes to be a referred policy oriented general interest book series, designed to cover the wide range of topics from sciences to social sciences, trying to provide space to intellectual persuasion aimed at development with a focus on the state of Jammu and Kashmir.

This first edition of the series, a compendium comprising of research based write ups designed at critically analyzing and dispassionately discussing and in a way comprehensively covering a wide range of the issues of current concern seems to explain many a phenomenon simplest possible terms.

Heartening to note, that a young IT and Management professional-turned-media person, Mr Riaz Ahmad Patloo, has initiated efforts to bring out this edition, with the help of the contributors to this collection.

Having multiple degrees at hand, R.A. Patloo, it may be mentioned, has studied management and information technology besides he is actively interested in media, so it should not be surprising that he has dared to undertake the project to provide a forum for comprehensive analysis of the challenges and opportunities of the contemporary times in the context of our state.

Being a maiden attempt, the perfection could not have been the criterion; nevertheless the book appears to be a significant contribution to our understanding of our conditions in different walks of life.

I understand the compilation will fulfill an urgent need of our society and the contents therein will be found useful by the specialist scholars and students besides the general masses and for the planners it will serve as a purposeful text for the development of our society on healthy lines.

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